

# THE IRON AGE

THURSDAY, SEPTEMBER 17, 1891.

## Vertical Blowing Engine.

The Columbus Machine Company of Columbus, Ohio, have placed on the market the blowing engine of which a perspective view and drawings of the principal details are here presented. In this particular engine the steam cylinder has a diameter of 18 inches, the blowing cylinder of 48 inches, the common stroke being 24 inches. The peculiarity of the engine lies in the form of the heads at the top and bottom of the cylinder, which are formed with induction and induction ports, the fact that the valves can be readily replaced, the form of the piston, and such construction that when the engine is on the down stroke the valves covering the induction ports at the top of the cylinder will be opened and the induction ports closed, and the induction ports at the lower end of the cylinder closed and the induction ports opened.

The heads D D<sup>1</sup>, Figs. 2 and 3, secured to the upper and lower ends of the air cylinder, are formed of the outer flange *d* and the inner flange *d*<sup>1</sup>, which are connected by vertical radial walls, *d*<sup>2</sup>, forming air induction ports, *d*<sup>3</sup>. Between the openings in the outer flanges *d* are formed the radial suction ports *d*<sup>4</sup>, which for about one-fourth of the circumference of the heads at certain positions of the piston head act as exhaust ports. The following means are employed in order that the ports may be opened and closed when it is desired to force the air in the cylinder through the conveying pipes to the blast furnace. Secured upon the outer faces of the flanges *d* of the heads by means of suitable bolts are covers or caps, E E<sup>1</sup>, resting upon rings, *e*, Fig. 6, at their outer edges and having at their central part a perforated boss. Ribs connect the flange and the boss, forming a space adapted when in position upon the heads to cover the exhaust section of the heads. Together with these ribs are others, which divide the heads into quarters, forming spaces which when the covers are in position upon the heads are designed to separate the induction and induction ports. The letter *f*<sup>4</sup> designates metallic plates of the contour of the spaces, to which are riveted rubber seats, *f*<sup>5</sup>, of the contour of the induction and induction ports; and in order that the valves may be controlled in their movements against the action of the piston and the atmosphere, springs *f*<sup>6</sup> are secured to the plates, as shown in Fig. 7. It has been found only necessary to employ springs on the valves at the lower head of the cylinder, as the valves will of

their own gravity remain closed at the upper head of the cylinder.

Projecting from the heads at their discharge section are the laterally extending pipes G, having bolted to their outer ends elbows *g*, which in turn are connected by a vertical pipe (shown in the perspective view), provided in its side with an opening adapted to receive one end of a pipe which leads to the blast furnace. It will be seen that about three-quarters of the area of the heads of the cylinder is oc-

cluded by the valves instead of the triangular-shaped openings, as is the case on the inlet section, so that the air in entering the cylinder head first passes through the triangular shaped openings (covered by valves), then through the parallel-sided openings into the cylinder, and in escaping from the cylinder the air first passes through the parallel-sided openings (covered by valves), and thence through the triangular-shaped openings into the exhaust pipe. It will be further

noted that the valves for closing the openings in the cylinder head are made in sections or quadrants that have secured to them a series of cushions that on the inlet sections fit over the openings from the atmosphere and on the exhaust section that close the openings from the cylinder, so that the air on entering the cylinder raises the sections of the inlet section and passes beneath them, thence over the intervening partitions that separate the openings from the atmosphere from the openings leading to the cylinder and through these openings leading to the cylinder into the cylinder, and when escaping from the cylinder the air passes through the parallel-sided openings of the exhaust section of the heads of the cylinder, raises the quadrant section composing the valve of the section, thence over the intervening partitions that separate the openings leading from the cylinder from the openings that lead to the exhaust pipe, and through the openings that lead to the discharge pipe.

## The Piston.

The construction of the piston is shown in the perspective and sectional views, Figs. 8 and 9. It is so designed that the piston springs can be adjusted without requiring the removal of the follower plate. The piston head consists of a horizontal plate from which rises a vertical annular flange formed with a series of openings. Rising from the central part of the head is a hollow boss, having between its upper and lower edges an annular shoulder designed to receive a flanged collar provided at its lower edge with a flange having openings formed in it. At the upper edge of the collar is a flange in which are cut gear teeth, as shown in Fig. 8. The rods A project through the openings formed in the flange of the collar and have secured to their outer ends piston springs. Upon the outer ends of the rods are placed sleeves, which abut against the inner face of the piston springs and are provided at one end with an annular flange, forming a support for one end of the coiled springs, their opposite ends abutting against col-



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cupied by the inlet openings, that have direct communication with the atmosphere through the spaces formed between the flanges of the head; that such inlet openings are triangular in shape and alternate in position with openings having parallel sides that lead to the cylinder, while the exhaust occupies only about one-quarter the area of the head; also that, while the openings in the exhaust section of the heads of the cylinder are the same in outline as those on the inlet section, yet the position of the valves and the movement of the air are reversed, the parallel-sided openings on the exhaust





a speed of 11 miles per hour. The boiler is of the usual marine type, 8 feet 9 inches in diameter by 8 feet 9 inches long, having two furnaces 2 feet 6 inches in diameter. The grate surface is 24 square feet. The total weight of boiler and machinery is 40 tons, and the displacement of the vessel in her working trim is 110 tons.

### Electric Cables in the St. Gothard Tunnel.

The two electric cables laid through the St. Gothard Tunnel during the winter of 1881-82 proving insufficient for the increased traffic, have recently been supplemented by the addition of two cables for telephone service, one containing three separate conductors and the other two conductors arranged concentrically. The experience gained with the old cables (one a seven-conductor telegraph and the other a single-conductor signal cable) has not been quite satisfactory. These cables

of crossing over necessitated the frequent taking up and relaying of rails in the short interval between two succeeding trains.

### Trade With Colombia.

The latest returns of the imports and exports of the Republic of Colombia, received by the Bureau of American Republics, show a considerable increase in the trade of 1890 over that of 1889. The total amount of foreign merchandise imported into Colombia in 1889 weighed 36,986,726 kg. and represented a value of \$11,777,624. The corresponding figures for 1890 show an advance to 43,413,377 kg. and \$13,445,792. The duties collected on imports in 1889 were \$7,801,600 and in 1890 \$8,627,688. The increase in the exports of the Republic has been even greater than the imports, the total for 1889 being \$16,199,718 and for 1890 \$20,457,855. The exports of coffee increased in value from \$3,516,293 in 1889 to \$4,262,030 in 1890. The exports of tobacco increased

without superior in any of our Eastern towns, furnished with all the latest appliances of electricity and a capital system of electric street cars throughout the city and suburbs.

### New Mexican Tariff.

A dispatch from the City of Mexico gives the following summary of the new Mexican tariff which has just made its appearance in the *Diario Oficial*. One of the most notable features of the new law is its greater definiteness. The number of classes of merchandise has been increased from 650 to over 900, with a corresponding gain in convenience. The free list retains coal, coke, wood, pulp, lumber, railway, telegraph, telephone and electric light supplies, barbed wire, iron pipe, sheet iron, Portland cement, explosives for mines, power machinery, boilers and engines, wheels, cables, ores, cordage, agricultural implements and a number of other articles. There are no ad valorem duties,

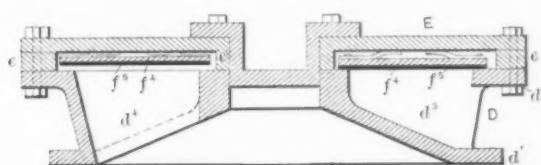


Fig. 6.—Vertical Section of One Head through Education and Induction Ports.

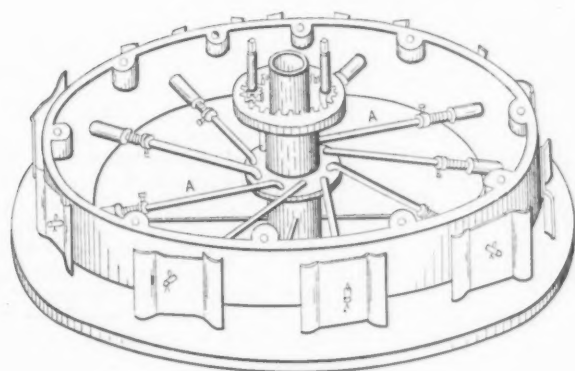


Fig. 8.—Perspective View of Piston Head.

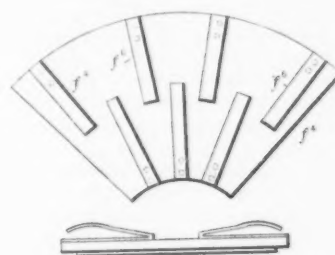


Fig. 7.—Detail View of One of the Metallic Valve Plates.

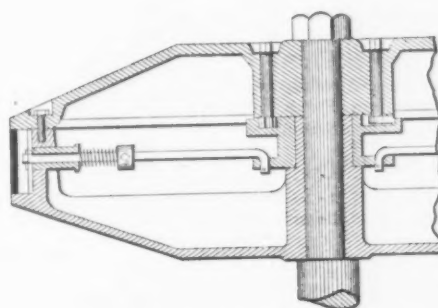


Fig. 9.—Vertical Section of Piston.

### DETAILS OF COLUMBUS BLOWING ENGINE.

were laid in an iron trough fixed on one side of the tunnel, and it was found that the water which accumulates in the trough where it sags between the supports had an injurious effect on the insulation. To determine the nature of this effect 150 samples of water were analyzed, and in many cases found to contain sulphureted hydrogen and sulphates. Moreover, it was found that owing to the slower combustion in the air of the tunnel the smoke from the locomotives contains considerable quantities of ammonia and sulphurous acid, which, together with the carbonic acid, are absorbed by the water. It was therefore determined to abandon the previous method of laying the cables into a trough, and to lay them directly in the ground. The old cables have also been relaid in this manner. A trench about 2 feet in depth was dug and filled first with 2½ inches of gravel, then 2½ inches of sand. Upon this were laid the four cables, and covered with 9 inches of sand, covered by granite flags and the rest made up with ballast. The work in laying was complicated by the necessity of crossing over from one side to the other in the middle of the tunnel, to avoid certain springs. This work

from \$798,029 in 1889 to \$1,820,756 in 1890, and the exports of gold and silver coin increased from \$315,887 in 1889 to \$1,024,964 in 1890. The following table shows the increase in exports to the four principal countries with which Colombia trades:

Country.	1889.	1890.
Great Britain.....	\$4,547,628	\$4,835,321
United States.....	3,950,531	4,636,480
France.....	1,781,619	1,566,636
Germany.....	1,410,683	2,475,388

These figures appear to indicate that the United States is gaining rapidly upon Great Britain as the chief consumer of Colombian products and Germany is taking the place of France as chief consumer on the Continent. If Minister Abbott succeeds in securing the consent of the Colombian Government to the reciprocity proposals which he recently took back with him to his post this country may considerably enlarge its export trade to Colombia to keep pace with its growing import trade.

Jay Gould, on his Western trip, found that Salt Lake is rapidly becoming a great city, with fine blocks of buildings, almost

and unless otherwise specified the following duties are so much per kilogramme: Crude petroleum is increased from 1 to 2 cents; white refined is unchanged. Fixed oils not specified are reduced from 50 to 20 cents and lubricating oils to 5 cents. Carriages are unchanged, and will pay from 35 to 60 cents, according to weight; unfinished and upholstered carriages will only pay for the same class from 10 to 30 cents. Fire arms are somewhat reduced. Rubber cloth and rubber clothing will be increased from 30 cents to \$2; machinery for industrial use, agriculture, mines and the arts is to be free of duty when it is not arranged to be moved by crank, pedal or lever; if so arranged it is to pay 5 cents. Tools are reduced from 10 cents to 5 cents, steel ingots are reduced from 5 cents to 3 cents, angle iron will be 3 cents, sheet iron and corrugated iron, galvanized or not, 4 cents. Iron beams will remain at 1 cent. Manufactures of iron, not otherwise specified, will be increased from 20 cents to 25 cents. In many cases legal weight is substituted for gross weight—that is, the goods do not have to pay the duty on the box or barrels containing them.

# An Improved Fuel Gas System.

(Continued from page 290.)

While the subject of water gas is one on which there is much diversity of opinion, and even warm controversy, it would seem to be a matter capable of demonstrable expression, which, within certain limits, a proper understanding of the chemical reactions involved, will place on a basis of accurately-known quantities of relative cause and effect. The dissociation of steam in forming this gas is not, strictly speaking, the decomposition of water into its constituent elements, 2 atoms of hydrogen and 1 of oxygen (which if done by heat alone can only be at excessively high and impracticable temperatures), but, as shown by the formula expressing the reaction, it is the result of the greater affinity of the oxygen at, temperature of low incandescence, for the carbon of the fuel, and the hydrogen is, therefore, left free, by the combination of the oxygen with 1 atom of carbon in the formation of carbonic oxide. The physical reaction is precisely the same as that which occurs in the precipitation of the gold from a chloride solution by the introduction of sulphate of iron, in which the iron forms a chemical combination with the chlorine, on account of the greater affinity which it has for the former, leaving the gold free in the form of a precipitate. The hydrogen in this case is analogous to the gold, and the oxygen and carbon to the chlorine and iron. According to this formula,  $H_2 + CO$ , we ascertain the calculated elementary values of each constituent to be, for 1000 cubic feet of such water gas:

Atomic wt.	No. of atoms.	Wt.	Vol. me.
$H_2$	1	2	379.4
C	12	12	189.7
O	16	16	189.7
		30	758.8
Lbs.	Ratio.		
$H_2$	2	1.318	2.636 lbs. Hydrogen = 500 cubic ft.
C	12	1.318	15.816 lbs. Carbon = 250 cubic ft.
O	16	1.318	21.088 lbs. Oxygen = 250 cubic ft.
		39.530 lbs.	1000 cubic ft. water gas, $H_2 + C.O.$
The calorific value of this 1000 cubic ft. is :			
Hydrogen, 2.636 lbs. $\times$ 62,535 = 164,842.26			
Carbon, 15.816 lbs. $\times$ 12,906 = 204,021.30			
368,863.56 heat units.			

This carbon value is assumed on the hypothesis that the carbonic oxide is formed, like the water, from free oxygen in a fuel containing hydrogen, without calorific effect. This, of course, gives the full value of the carbon, whereas, if we consider the combination similar to that which occurs in ordinary combustion, we must deduct the amount of heat evolved, and would then have  $12,906 - 2495 = 10,411$  heat units per pound of carbon in the volume of carbonic oxide, which gives  $15.816 \times 10,411 = 164,660.38$ , which reduces the total value of the gas to 329,502.64 heat units. Although the former hypothesis seems logical, the latter is probably the correct one and is so accepted. In the dissociation of the above 23,724 pounds water vapor the 2.636 pounds hydrogen will absorb from the fuel as much heat as will equal its calorific value—i.e.,  $2.636 \times 62,535 = 164,842$  units, but as by its combustion we realize the same quantity, there is so far neither loss nor gain from the use of steam.

We have seen that 1 pound carbon in the form of carbonic oxide gives 2.33 pounds, or  $2.33 \times 13.58 = 31.64$  cubic feet, having a value of 10,411 units. And  $\frac{500}{1.64} = 15.816$  pounds carbon vapor in

1000 cubic feet of gas, which multiplied by the heat of the primary combustion =  $15.816 \times 2945 = 39,461$  units evolved in the conversion. Thus the net amount of heat absorbed from the fuel in the dissociation of the steam will be  $164,842 - 39,461 = 125,381$  units expended to pro-

duce a return of 164,842, or a net gain of the 39,461 units. The abstraction of the 125,381 units shows conclusively that it is impossible to continuously effect the combustion necessary to this conversion without an auxiliary supply of free oxygen from the air in order to main-

Combustible.	Cubic feet.	Vol. per pound.	Weight. Pounds.	Weight. Per cent.	Calorific value.	Total heat units.
$CO$	113	13.58	8.321	13.880	8.321 $\times$ 4,462	37,128
$H$	177	189.7	0.933	1.556	0.933 $\times$ 62,535	58,355
$CO_2$	122	21.71	5.146	8.583	5.146 $\times$ 25,313	130,261
$C_2H_4$	3	13.55	0.2214	0.370	0.2214 $\times$ 19,996	4,427
Incombustible.						230,171
N	480	13.55	35.424	59.085	By previous analysis..	158,219
$CH_4$	47	8.64	5.44	9.073	Gain.....	71,952
$H_2O$	11	21.00	0.524	0.873	71,952	
O	47	11.89	3.945	6.580	158,219 = 45.48 per cent., or	
	1000		59.9544	100.000	71,952 = 31.26, percentage of	230,171
					total heat value of the gas.	

Note.—In order to properly appreciate the comparative calorific values of these gases, it should be expressed volumetrically, as gases are always given per 1000 cubic feet. The total heat values of the constituents of these analyses will be, therefore, per cubic foot as follows:

	Calorific value.	Vol. per pound.	Value per cubic foot.
Hydrogen.....	62,535 + 189.7	= 329 heat units	
Carbon.....	12,906 + 15.85	= 814 heat units	
Carbonic oxide..	4,462 + 13.58	= 33 heat units	
Marsh gas.....	25,300 + 23.71	= 1067 heat units	
Heavy hydro carbon, $C_2H_4$ .....	19,986 + 13.55	= 1475 heat units	

As this last item is always in very small percentage, its high value is of very trifling importance. The very great volumetric value of marsh gas, as compared with the other constituents is, therefore, apparent, being over three times that of hydrogen.

duce a return of 164,842, or a net gain of the 39,461 units. The abstraction of the 125,381 units shows conclusively that it is impossible to continuously effect the combustion necessary to this conversion without an auxiliary supply of free oxygen from the air in order to main-

combustion of the carbon was found to be 19.255 per cent., the use of steam saves of that amount  $\frac{15.6}{19.255} = 80$  per

cent. nearly. Notwithstanding this improved showing, however, there is still a very serious source of loss, from the fact that a large percentage of the volume of gas discharged from the producer gives no useful effect in the furnace, being not a fixed gas, but merely condensable vapor, very rich in carbon, and of high heating value. This is the source of the annoying tar formation before referred to, and it is purposed to ascertain, by comparison with the foregoing analysis, what percentage of heating value can be realized in practice by their conversion into fixed gases in the producer. The following quantities are obtained from the performance of the new generator of the Chicago Heat Storage Company, a description of the construction and operation of which will be given later on. The analysis is one of many, and is a fair average:

Combustible gases.	Cubic feet.
Hydrogen, H	177
Carbonic oxide, $CO$	113
Marsh gas, $CH_4$	122
Heavy hydrocarbons $C_2H_4$	3
Incombustible gases.	
Nitrogen, N	480
Carbonic acid, $CO_2$	47
Water vapor, $H_2O$	11
Oxygen, O	47
Total.....	1000

From which we deduce Table VI.

These results, of course, represent manly the relative values of the gases produced by the different systems, while the actual comparative economy must be considered on the basis of useful effect derived from the fuel from which the gas is generated. The amount of gas by the ordinary producer process is about 130,000 cubic feet per ton of 2000 pounds. That from the Chicago system is about 100,000 cubic feet. By analysis of the former we have seen the calorific value to be 158,218 heat units per 1000 cubic feet, therefore  $158,218 \times 130 = 20,568,340$  heat units per ton of coal. As the latter gas shows 230,171 heat units per 1000 feet, and 100,000 cubic feet per ton, we have  $230,171 \times 100 = 23,017,100$  heat units per ton. Hence, by comparison of the fuel

Table V.

tain the necessary temperature. In other words, we require a supply of atmospheric oxygen sufficient to convert 125,381  $\frac{2,945}{125,381} = 50.25$  pounds carbon into carbonic oxide in order to continue the operation uninterruptedly. This, apparently, is the maximum theoretical limit to the relative amount of water gas possible. In practice, of course, this quantity is further limited by the nature of the fuel and the character of the combustion. That practice does confirm the above deductions is shown from the following analysis of gas from a Siemens producer, in which steam was used:

Combustible	{ Hydrogen, H.....	12.0
	{ Carbonic oxide, CO.....	28.0
	{ Marsh gas, CH <sub>4</sub> .....	2.5
Incombustible	{ Carbonic acid, CO <sub>2</sub> .....	2.5
	{ Nitrogen, N.....	55.0
Total.....		100.0

And the calorific value of 1000 cubic feet of this gas will be:

And the calorific value of 1000 cubic feet of this gas will be:

Cub. feet.	Vol. per lb.	Weight. Lbs.	Calorific value.	Total heat units.
H	120 + 189.70	= 0.632	$\times$ 62,535	= 39,522.12
$CO$	280 + 13.58	= 20.620	$\times$ 4,462	= 92,006.44
$CH_4$	25 + 23.71	= 1.0544	$\times$ 25,313	= 26,690.03
Total.....				158,218.59
From analysis without use of steam.				133,548.36
Apparent gain by use of steam.....				24,670.23



values of the two systems 23,017,100 — 2,448,760 = 20,568,340 = 2,448,760 = 11.905 per cent. gain by Chicago system. Comparing these results with the total theoretical heat value, as shown to be possible from the average analysis previously given, we find 14,009 heat units per pound of coal = 14,009 × 2000 pounds = 28,018,000 heat units per ton. The calorific value by the first process is therefore 20,568,340 = 73.41 per cent. of the theoretical value of the coal.

By the second process we have 23,017,100 = 82.15 per cent. of the theoretical value. Reducing these values to the evaporation basis:

Total theoretical value  $\frac{28,018,000}{966} = 29,004$  pounds water per ton of coal = 14 5 pounds water per pound of coal.

First process  $\frac{20,568,340}{966} = 21,292$  lbs. water per ton of coal = 10.65 pounds per pound.

Second process  $\frac{23,017,100}{966} = 23,807$  pounds water per ton of coal = 11.91 pounds per pound.

These figures represent the total evaporation value of the generator performance, and take no account of the losses previously mentioned as occurring in the utilization of the gaseous fuel in boiler or other furnaces. Having no data showing actual evaporation performance from the ordinary producer system under like conditions, no comparison can be made, but the following result of a very careful test made on July 8 last gives valuable information as regards the work of the new system. The test was made by a large manufacturing concern of Chicago, with a view to obtaining accurate and disinterested data as to economy and efficiency, their object being the adoption of the system for their entire establishment if found satisfactory. For this purpose the Heat Storage Company turned over to them the management of their plant, free from all interference. The test was upon the evaporation basis and continued uninterruptedly for ten hours. Coal used was a fair average of good quality Wilmington, Ill., block. Feed water was not heated, the temperature throughout being 66° F. The boiler used was a nominal 60 horsepower horizontal tubular, 54 inches diameter by 16 feet long, 36 4-inch tubes. For the greater part of the time the fire was forced, which was not in the interest of economy. Average temperature of waste gases 390°, maximum 400°. The waste heat utilizer was not used. The following results were obtained:

	Pounds.
Total weight of coal burned.....	1,600
Total weight of water evaporated from and at 212°.....	16,771
Pounds of water from and at 212° per pound of coal.....	10.48

Assuming a fair calorific value of the fuel to be 12,500 heat units per pound, the possible theoretical evaporation from and at 212° would be  $\frac{12,500}{966} = 12.94$  pounds water per pound of coal. Therefore the results show  $\frac{10.48}{12.94} = 81$  per cent. of the total theoretical value of the coal.

Had the waste heat utilizer been used the temperature of stack gases would have been 190°, which with 2100° initial temperature =  $\frac{190}{2100} = 9$  per cent. But as the actual temperature was 390°, and  $\frac{390}{2100} = 18.6$  per cent., the gain would have

been 18.6 — 9 = 9.6 added to the above = 88.776 per cent. efficiency. It has been mentioned that gas from the ordinary producer is deprived of about 300° of the sensible heat with which it leaves the producer. This represents a certain percentage of the total calorific value of the gas, and may be calculated as follows: The mean specific heat of the several gases shown by the analysis is 0.2604 and 0.2604 × 65.7869 pounds in 1000 cubic feet gas = 17.0314 × 300° = 5109 heat units =  $\frac{5109}{158,219} = 3.23$  per cent., or  $\frac{5109}{966} = 5.29$  pounds water evaporated from and at 212° per 1000 feet gas, or  $\frac{5.29}{15.461} = 0.336$  pound water per pound coal.

In the Chicago system the gas leaves the generator at about the same temperature as the former, 550° and enters the stack at 190°, thus rendering available 360° F. sensible heat of value, as follows: Mean specific heat 0.3034 and 0.3034 × 59.9544 pounds in 1000 feet = 18.1939 × 360° = 6550 heat units =  $\frac{6550}{230,171} = 2.84$  per cent., and  $\frac{6550}{966} = 6.78$  pounds water evaporated from and at 212° per 1000 feet of gas; or  $\frac{6.78}{20} = 0.339$  pound water per pound of coal.

In the foregoing, the comparison has been made only between the ordinary and the improved systems of gaseous fuel. As there is unlimited data showing results from the best practice of ordinary grate firing, it will be superfluous to go into detail as regards this system. A comparison of these results on the evaporation basis will serve to show the relative efficiency.

In the system of the Chicago Heat Storage Company, the broad principle aimed at, was the increase of efficiency by conversion into fixed gases, of the volatile hydrocarbons which hitherto have been condensed as tar; and incidentally, the prevention of smoke. The agent of this conversion is saturated steam, at a minimum gauge pressure of 10 pounds per square inch.

(To be continued.)

### Harrington's Nickel Steel Experiments.

Thomas Harrington of Pittsburgh has been conducting a series of experiments on nickel steel which have attracted considerable attention recently. The following statement in regard to them has been made for *The Iron Age*:

Mr. Harrington has made a careful study of the properties imparted to steel by an alloy of nickel, and has spent much time and no inconsiderable amount of money in experiments in so amalgamating iron and nickel that a perfectly homogeneous structure is obtained, and that the desired percentage of nickel can be given without variation beyond a fraction or two. In other words, his experiments were first directed to overcome the peculiar tendency that nickel has to porosity, either by itself or as an alloy, and having fully satisfied himself and others that he could do this without variation, he next directed his efforts to producing uniformity of percentage of nickel and of the carbonization of the steel made—the latter being a very difficult matter. He has succeeded, the fluctuations in points of carbon varying very little, and those fluctuations being attributable, in his opinion, to the fact that a perfectly pure carbon cannot always be obtained, so that the fluctuation is due to the unknown quantity of pure carbon introduced in the mass of carbonizing material.

Steel has been made containing nickel in various percentages from 1 to 25 per

cent., a perfectly homogeneous structure being obtained in each instance. The addition of so little as 1 per cent. of nickel to steel adds greatly to its strength, imparts a quality of toughness most surprising, and gives the fracture a color much whiter than ordinary steel, which takes a polish like that of silver steel.

Perhaps the following results may better illustrate what properties are imparted:

No. 1, 2½ per cent. of nickel, made at La Belle Steel Works, Allegheny, Pa. The stock was that used for making ordinary La Belle spring steel, the normal tensile strength of which is from 55,000 to 60,000 pounds per square inch. Tested physically by the Pittsburgh Testing Laboratory the following results were obtained.

Dimensions.....	0.499
Area.....	0.1956
Elastic limit, pounds.....	18,000
Maximum load, pounds.....	30,000
Elastic limit, pounds per square inch.....	92,020
Tensile strength, pounds per square inch.....	153,350
Elongation in 2 inches.....	0.05
Elongation, per cent.....	2.5

Chemical test, Laboratory of La Belle Steel Works, Geo. G. Glass, chemist.

Nickel steel No. 1.	Per cent.
Carbon.....	1.14
Silicon.....	3.60
Nickel.....	2.50
Cobalt.....	trace

Specimen No. 2, made from stock of slightly inferior grade, showed by physical test made by the Pittsburgh Testing Laboratory the following results:

Original dimensions.....	0.510
Area.....	0.2043
Dimensions after fracture.....	0.447
Area.....	0.1569
Elastic limit, pounds.....	14,000
Maximum load, pounds.....	21,500
Elastic limit, pounds per square inch.....	68,520
Tensile strength.....	105,200
Elongation in 2 inches.....	0.34
Elongation, per cent.....	0.17

No chemical test was made except for carbon, which was 70 points.

Specimen No. 3 was made at Stirling Steel Works, Demmler, Pa., of Swedish stock and scrap, with 2½ per cent. nickel. This piece was tested only for carbon, which was given at 214 points, three points less than the specimen made under the personal direction of C. Y. Wheeler, president of the company, at the same time. Tools were made from this bar and tested in comparison with Mushet tool steel by the Westinghouse Electric Company, the H. K. Porter Locomotive Works and the Verona Tool Works, the workmen in each case pronouncing the tool used equal if not superior to the Mushet steel for severe work.

Other tests were made of steel made from the lowest-priced stock to be obtained for crucible steel, showing much greater tensile strength and elasticity than can be obtained from steel made from similar stock unalloyed with nickel.

Razors were made from the specimen made at the Stirling Works out of one of the tools used in the initial test, which are now being tested, and which, so far as tested, show superior edge-retaining qualities and keenness, indicating that for fine cutlery a small percentage of nickel is desirable.

In addition to taking a brilliant polish, its ease of manipulation under tools, readiness with which it can be tempered, and greater tensile strength, nickel steel has another quality which makes it desirable for purposes where a polish is desired—that is, it oxidizes so very slowly, even under great exposure to moisture, that it may be said, within certain limitations, that it is non-oxidizable. This ought to make it desirable for the higher forms of cutlery, such as surgeons' and dentists' instruments, razors, pocket cutlery, &c., and for plates for steel engravers, dies for stamping and kindred purposes, because of its greater tensile strength and toughness. Just at what percentage the quali-

ties of strength and toughness cease by the addition of nickel to steel is as yet not definitely determined. Experiments so far seem to indicate that the maximum of strength is reached at from 20 per cent. to 25 per cent., with great density of structure and exceeding toughness. At 25 per cent. the alloy takes a brilliancy of luster when polished more beautiful than nickel or silver plated ware, and which does not tarnish near so rapidly.

By far the most brilliant luster attained, far surpassing that of pure silver and in rich beauty excelling that of gold, in nickel alloys, is that on an alloy, so far unknown to metallurgy, made by Mr. Harrington, called nickel-steel bronze and about which nothing has ever until now appeared in print. Its constituents are iron, nickel and copper, in nearly equal proportions. This bronze, which Mr. Harrington refuses to allow to go out as yet, because of his desire to discover more of its properties, is designed to take the place of German silver in the manufacture of table cutlery, such as spoons of all

cured by real estate mortgage, aside from State and railroad land contracts, January 1, 1890, was \$235,485,108, of which the debt on acres is \$167,145,000, or 70.98 of the total. There is an existing indebtedness of \$3,667,735 on the State land sales and of \$3,393,983 on railroad sales. This added to the mortgage debt makes a total debt of \$243,146,826, of which \$174,720,071 is on farms.

### The Eureka Furnace.

William Stubblebine of the Bethlehem Iron Company, South Bethlehem, Pa., is so long and so favorably known as the designer of the furnace which bears his name that his latest invention in the same field will command the general attention of mill men. The Bethlehem Iron Company have eight puddling furnaces and six heating furnaces of the Eureka pattern. The Bryden Horseshoe Company, of Catsauqua, have recently put in one; the Catsauqua Mfg. Company are putting two into their

pany takes up less room than the old furnace and has a larger capacity by 15 tons.

### The St. Clair Tunnel.

One of the most momentous events this portion of the globe has seen in many years, says a Detroit journal, will occur on September 19 in the opening of the tunnel which the Grand Trunk Railway has constructed under the St. Clair River. It is, perhaps, too near home to be thoroughly appreciated by the people of Michigan, but it does not require a very close study of current events to note that the tunnel is regarded as a remarkable and interesting experiment by railroad and engineering experts throughout the world. It has been described and commented upon by the leading newspapers and periodicals of the globe, and some opinions upon it lead a layman to believe that we have here upon the national boundary a hole in the ground that, if it prove a success, will revolutionize tunnel building among all nations of the earth. And, besides this interesting view of it, there is yet another to make it an object of absorbing attention. It is the first substantial and permanent connecting link to pierce the watery barrier between the Union and the Dominion anywhere from Niagara to Sault Ste. Marie. It is practically the outstretched hand of Canada asking for those closer relations in society and business which should prevail between two countries that ought to be but one. Let us hope the Port Huron and Sarnia tunnel is

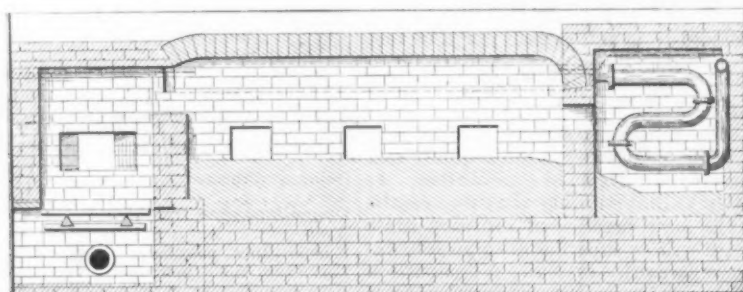


Fig. 1.—Vertical Section.

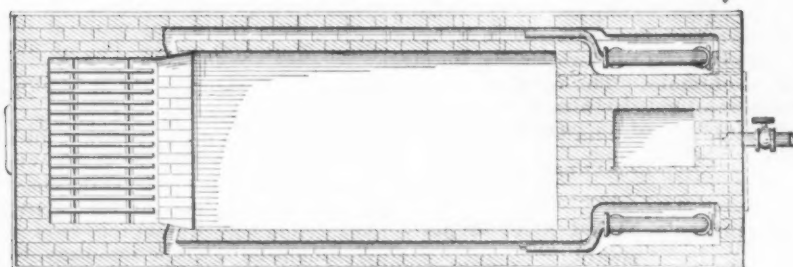


Fig. 2.—Horizontal Section.

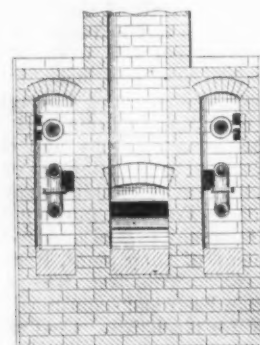


Fig. 3.—Transverse Section through Heating Chambers.

### THE EUREKA HEATING FURNACE.

sizes, spoon handled forks, fruit and butter knives, nut picks, nut crackers, &c., and perhaps for knives also, as it takes a temper and retains an edge such as table knives usually have.

The qualities expected to recommend it are that it will permit of greater delicacy of design than German silver, because, after manipulation, it can be hardened sufficiently to give it firmness and strength without bending or breaking, and that by reason of the admixture of the nickel and copper it will lend itself much more readily to plating with either nickel or silver, because of the affinities the plating material would have for the metal itself.

In alloying steel with nickel Mr. Harrington uses only the refined nickel. He has used both the English and American nickel, and although the latter is in some respects more refractory than the English, he prefers to use it for two reasons: 1. Because it is American nickel. 2. Because he thinks better results are obtained from its use.

Official figures relating to the mortgage indebtedness of Kansas show the total existing debt of the people of Kansas, se-

Catsauqua mill, and one large furnace into their Ferndale plate mill.

The characteristic features of the design are clearly shown in the accompanying engravings. The gases from the furnace are split, when issuing from the reverberatory chamber, into three parts; the one passing through the uptake through the stack. On either side thereof two flues, faintly dotted in the plan, Fig. 2, lead to two heating chambers, in which are placed coils of pipe through which air is blown and in which it is preheated. The heated air issues from two nozzles, shown in Fig. 2, into mixing flues in the side walls of the furnace. In this manner the gas in the preheating chambers is drawn by the suction created into the mixing flues, which discharge them into the flame at the firebridge.

Practical experience with the furnace has taught that it works well on billets and on large or small fagots. It heats quickly, and the flame is under such control that the waste by oxidation is very low. In heating iron it has proved to be 2 per cent. It is claimed that the saving in fuel amounts to 25 per cent. The furnace at the Bryden Horse Shoe Com-

but the first of dozens, and that the dozens will be built because demanded by the immense volume of trade which the union of the two countries would draw across the boundary line in both directions. Let us hope the dozens will come, and come soon.

**A New Smoke Consumer.**—At Pittsburgh last week a test was made of the Western Smoke Preventer Company's apparatus on one of the engines of the Pittsburgh Junction Railroad. After arriving at the place appointed for the test, the engine was detached and nine freight cars filled with slag and coke, making a load of about 185 tons, were coupled to it. The train was then run down the track about 300 yards, and returned to the starting point without the smoke preventer being applied and great volumes of smoke rolled from the stack. The engine and cars were then turned to the starting point and the smoke preventer was attached to the engine. The same run was then made, and it is claimed that no smoke of any account was seen. The device consists of air jets pierced in the front and rear of the fire box of the engine.



**Pipe Cutting and Threading Machine.**

The accompanying engraving represents one of a new line of pipe cutting and threading machines, ranging from  $\frac{1}{2}$  inch up, built by the Wells Machine Works of Fostoria, Ohio. The cut represents a hand machine, which can be taken from its base, is easily transported and can be readily fastened to a bench. The dies are made in sections, are adjustable and can be removed and replaced easily; they are gauged to standard fittings but can be instantly set for variable fittings; they can be opened to remove the threaded pipe without reversing. The cutting-off mech-

carloads from Southern furnaces to points North, East and West. The rates went into effect on September 7.

**WORLD'S FAIR NOTES.****Building Progress.**

Nine of the great buildings are now under way, and 2000 workmen are employed on them and in grading the grounds. Excepting the buildings devoted to fine arts and machinery, and the Casino edifice, all the structures of the exposition

being built in. Some of its main supports, which are 120 feet in height, have been advanced to 40 feet, and the structure is even thus early conspicuous.

The Manufacturers' Building has now been started in earnest. Agnew & Co., the contractors, with a large force of men and an adequate plant of machinery, have already laid 200 foundation piers for the building, which will be erected in sections to insure its speedy completion.

The improvements in charge of the landscape department have been given a new impetus by the arrival from Boston of F. L. Olmsted, landscape architect of this portion of the work. A conference between Messrs. Olmsted and Codman of the Landscape Department and Chief John Thorpe of the Horticultural Department has resulted in an agreement on the part of Mr. Olmsted to grant Mr. Thorpe ample space upon the Wooded Island for a magnificent floral exhibit of roses, rhododendrons and herbaceous plants.

**Fair Finances in Good Shape.**

Exposition finances are in better condition than the Board of Directors had expected. The third call of 20 per cent. on the capital stock of \$5,000,000 has been issued. It was due September 1, and on the first three installments, which should net \$3,000,000, \$2,857,380 has been collected, so that there remains but \$142,620 to be paid in before the Exposition Company can call on the city of Chicago for the sale of the \$5,000,000 of bonds which it agreed to issue when the stockholders should have paid in \$3,000,000. On the 11th inst. Treasurer Seeberger reported a cash balance on hand of \$1,884,506. The sale of the \$5,000,000 of city bonds, or rather the placing of them on the market, is speedily assured. The money, too, is needed to pay the contractors who are at work on a majority of the great buildings. Their total cost will reach approximately \$8,000,000, and by the terms of the agreement the contractors are to receive monthly payments, so that the total available cash to date of \$1,884,506 which Treasurer Seeberger's report shows will be more than needed.

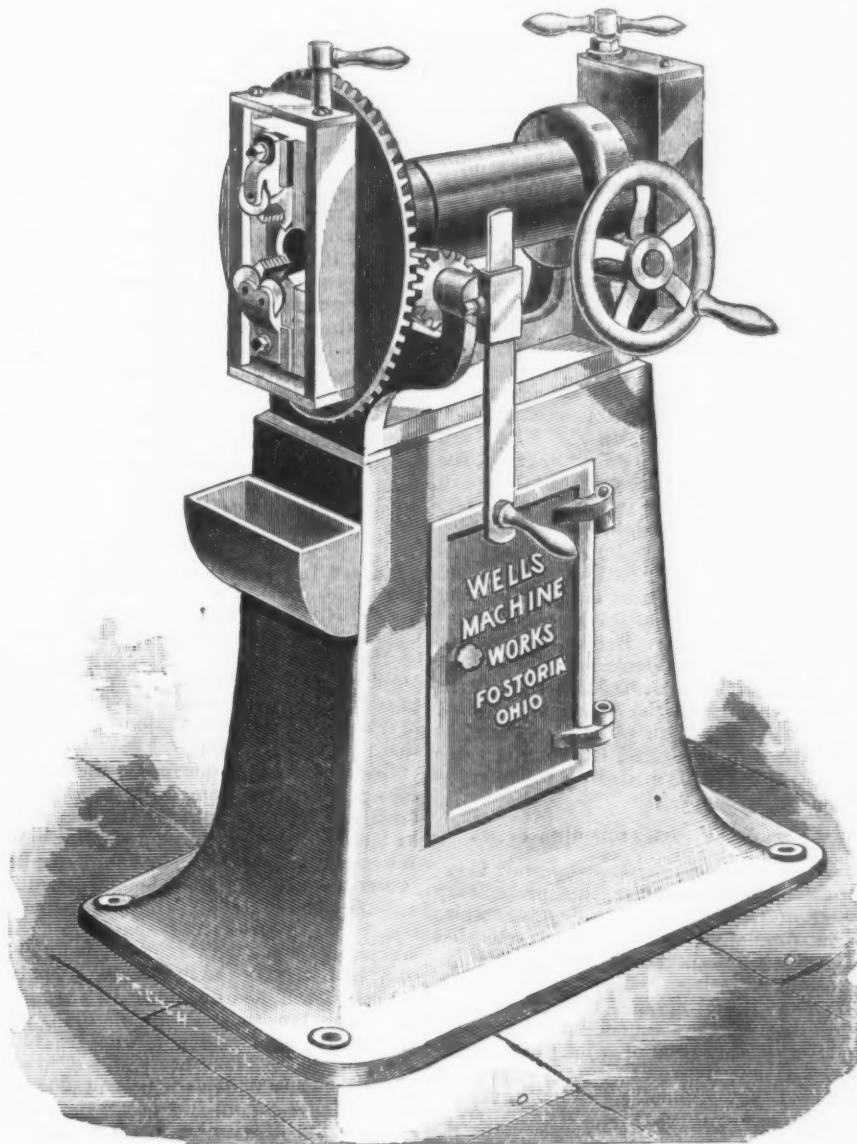
**Foreign Representation at the Fair.**

The nations which have formally accepted the invitation to participate in the exposition are here given in the order in which their official acceptance has been received by the Department of State: France, Spain, Great Britain, Mexico, Colombia, Germany, Peru, China, Venezuela, San Domingo, Chili, Turkey, Persia, Russia, Japan, Jamaica, Hayti, Siam, Ecuador and Uruguay. The Latin American Bureau reports in addition the acceptance of the Argentine Republic, Brazil, Salvador, Guatemala, Honduras, Nicaragua and Costa Rica.

But two have declined, and it is noticeable that neither of the countries was officially represented at Paris. In a communication from the Minister of Foreign Affairs of the Netherlands Government, dated May 18, acknowledging the invitation, the following language is used: "The Government finds that but a few years ago the States generally took ground in opposition to the Netherlands being officially represented at international expositions, adopting this principle—that in such cases industries ought to act independently; consequently the Royal Government is not able to accept the invitation given it."

The Government of Egypt, in declining, says it cannot participate officially, but will aid Egyptian exhibitors in every way possible.

Notice was received at headquarters of the intention of the Brazilian Government to make a magnificent display at the coming exposition, and to invest not less



PIPE CUTTING AND THREADING MACHINE.

anism shown consists of three wheel cutters, actuated by the same screw that actuates the dies, thus permitting the cutting and threading of the pipe with one closing of the vise and without removing the dies or cutters. For larger pipe a square cutting-off knife with positive screw feed is used. The vise has powerful steel jaws constructed to grip the smallest pipe, has longitudinal motion, by means of cylindrical arbor and steel rod guides, and is actuated by rack and pinion. The larger machines have universal lead screw instantly connected or disconnected at will, which can be used independent of the rack and pinion, and *vice versa*.

The most elaborate and comprehensive sheet of rates on pig iron yet issued by the Queen and Crescent route has been sent out. It covers the rates on pig iron in

system are now in practical and active progress. The most notable advancement has been made in the Mines and Mining Building and that for the woman's exhibit. The first section of the entire structure of the latter building is now nearly completed, so far as the wood work is concerned, and soon it will be ready for the staff which will form the exterior covering.

Upon the Mines and Mining Building construction has been advanced with equal rapidity, the main flooring being completed. The iron for the columns and trusses of the great central court is being sent along by the King Iron Bridge Company. A considerable quantity of it is now on the grounds, and the erection of this iron superstructure is the next feature.

Work on the Transportation Building has been progressing during the week, and its site, nearly 100 x 250 feet, is rapidly

than \$500,000. It is proposed not only to erect a building, but to surround that building with practical illustrations of the methods of agriculture and industry. There will be a sugar mill in operation, a coffee quinta, at which the method of gathering and curing coffee for the market will be illustrated, and the manner in which rubber is gathered and prepared for market will be shown in a similar way. There will also be *fac simile* of native huts, with native families living in them. Furthermore, the national band of Brazil will be in attendance.

A report of the work done by the Latin-American Bureau up to date shows that 17 of the 18 American republics and all of the colonies that have been visited by World's Fair agents have accepted the invitation to participate in the exposition and are actively preparing for proper representation. Aside from Mexico, for whose appropriation of \$750,000 the Latin-American Bureau claims credit, the appropriations made by American republics are as follows:

Guatemala.....	\$120,000
Honduras.....	20,000
Salvador.....	30,000
Nicaragua.....	20,000
Costa Rica.....	50,000
Colombia.....	100,000
Bolivia.....	150,000
Ecuador:	
General Government.....	\$100,000
Guayaquil City.....	25,000
Peru.....	125,000
Chili.....	100,000
Brazil:	
General Government.....	\$325,000
State of Rio de Janeiro.....	15,000
State of Minas-Geraes.....	25,000
State of San Paulo.....	30,000
State of Rio Grande do Sul.....	30,000
State of Parana.....	20,000
British Honduras.....	445,000
Jamaica.....	7,000
Cuba.....	10,000
Trinidad.....	25,000
Danish West Indies.....	10,000
Total.....	\$1,322,000

Brazil, Salvador, Nicaragua, Costa Rica, Colombia, Bolivia Ecuador and Peru will erect their own buildings, many of them the models of their own Government buildings. Mexico will produce one of the ancient Aztec or Toltec temples. The bureau has collected many valuable Columbian relics, which will be shown in La Robida on the grounds.

#### No High Tower for the Fair.

The probabilities of a high tower are beginning to wane. The Board of South Park Commissioners have declined to grant Messrs. Hale & Cragin a 50 years' lease of the site they have selected for their tower in the Midway Plaisance. Messrs. Hale & Cragin are the backers of the only tower scheme which has shown any signs of being carried out. They have been expecting they would be allowed to let the tower stand after the fair, but according to the terms of the ordinance granting the use of the park to the exposition management all buildings are to be torn down and removed by January 1, 1894. The commissioners refuse to modify this ordinance. They were requested to take the matter a little longer under advisement. They agreed to do it, but Commissioner Russell of the board said no modification would be made. He said further the commissioners had no power to lease the park grounds for a private enterprise. The projectors of the tower scheme say it would not pay them to invest \$2,000,000 in a tower which could stand only to the close of the fair. It was suggested they might purchase a tract of land adjacent to the park and build their tower to remain any time desired.

Instead of one big tower, the chairman of the Ways and Means Committee an-

nounces that there will be, if necessary, several small ones. He does not style them towers exactly, but observatory stations, which will rise from 150 to 250 feet high. The general sentiment of the committee is that observatory stations of this height will be more useful in obtaining a view of the grounds than a sky scraper. There are a score of small tower propositions before the committee, and it will find no difficulty in getting all the observatory stations it wishes.

#### Ornamental Electrical Features.

Expert electricians from different parts of the country are to be called before the Exposition management to give their advice as to the best methods of securing an ornamental electrical display on the exposition grounds. This course has been determined upon by the Committee on Electricity, which a few weeks ago was given enlarged powers and authority over electrical matters in connection with the exposition. Chairman Clowry of the committee is industriously at work scheming to bring about the most beautiful results that may be accomplished by electricity.

One of the features which have just been taken up is for a grand illumination of the plaza about the Administration Building. This building is the focal point, so far as beauty is concerned, of the exposition grounds. It is to be the central attraction from an architectural point of view, and here Mr. Clowry has begun his first work. In order to make this plaza, around which are arranged on the north the Mines and Mining and Electricity Building; on the east the basin 300 feet wide; on the south Machinery Hall, with its annex 1300 feet long, beautiful by night, it is proposed that portions of the buildings on this court shall have their outlines illuminated by series of incandescent lamps. This will make the south end of the Mines and Mining and Electricity Buildings and the north side of the Machinery Hall bright with electric light. At the extremity of the basin, which butts the plaza on the east, there will be a huge electric fountain, so that the Administration Building on three of its sides will be girded by softly glowing electric lamps.

#### To Try the Movable Sidewalks.

The Columbian Movable Sidewalk Company have commenced the preliminary work of their experimental construction. The promoters will erect an elevated movable sidewalk about 1000 feet in extension, creating a loop between the Woman's Building and the Illinois State Building. The system consists of movable platforms, the speed of which is so regulated that passengers can be conveyed without any difficulty and without the fatigue of ordinary travel. The object of the present construction is to test the expediency of the system and is done at the suggestion of the Grounds and Buildings Committee with a view to the possibility of its adoption for intramural transit if found to be successful.

There will be one stationary platform and two movable platforms. The one which moves the fastest will have seats 24 feet above the ground from which passengers can obtain a full view of the grounds. Carpenters will put up this elevated structure at once. Part of the lumber has arrived on the ground and the power house for an electric plant of 125 horse-power is being erected close to the Woman's Building.

The projectors expect to have the system at this experimental point in full operation in about four weeks, and they claim they can transport at least 35,000 passengers past a given point per hour.

#### The National Commission.

The National Commission adjourned last week until probably July 1 of next

year. During the session a great deal of business was transacted covering numerous details. Among the most important was the provision made for the appointment by President Palmer of the Committee on Award, to consist of 12 members. The entire subject of awards is to be under the control of the National Commission. It will endeavor to pay the money for continuing the functions of the committee, and the Board of Directors will have nothing to do with it. The committee was authorized to appoint a secretary at a salary not to exceed \$5000. President Palmer said he would not appoint the committee at present, as there was nothing for it to do.

President Palmer appointed the Committee on Federal Legislation, and announced the members to be as follows:

J. W. St. Clair of West Virginia, chairman; G. W. Allen, commissioner-at-large from New York; D. B. Smalley of Vermont, J. W. Woodside of Pennsylvania, R. L. Saunders of Mississippi, F. W. Breed of Massachusetts, C. H. Jones of Missouri, William Ritchie of Ohio, A. A. Wilson of the District of Columbia, P. H. Lannan of Utah, John T. Harris of Virginia, H. P. Rucker of North Dakota.

This committee was appointed for the special purpose of going before Congress and asking that the loan of \$5,000,000 desired by the local directory be granted. It will also ask that an appropriation estimated at \$750,000 be made for defraying the expense of the numerous juries of awards and the cost of medals, which it was decided should be awarded. The committee has on it some of the strong members of the commission.

#### Losses in the Argentine Republic.

President Pellegrini in a message to the Chamber of Deputies speaks of the gravity of the financial crisis in that country, and while doubting the efficiency of a new paper issue as a measure of relief, admits that apparently this is the simplest remedy that offers. He says:

Lest you should be amazed at the seriousness of this crisis an estimate must be made of the losses suffered in speculation by ourselves and by foreign capital here. We may calculate the amount of capital subscribed here at \$1,000,000,000, against \$200,000,000 in 1886. Taking the quotation of these stocks and shares in 1889, comparing same with those actually current, and striking the difference, will give the amount of loss sustained by the holders. The loss to land speculators is also very great. Our currency, whose normal value is \$260,000,000, has suffered in the last two years a depreciation of 200 per cent. in its real value. The loss to foreign capitalists exceeds £100,000,000, not including loans. The fall in Argentine railway shares in London represents a loss of £20,000,000 to the holders. The Free Banking act authorized the issue of public bonds as guarantee of the bank notes. The debt of the nation was thereby increased by \$90,000,000. The only credits that remain to the Government as deposits in the national bank are \$2,000,000 in gold and \$60,000,000 in paper. These colossal losses must be distributed among all who directly or indirectly took part in operations or speculations of the past. In this distribution of losses innumerable private fortunes must disappear, public and private credit must collapse, all business must be paralyzed in the midst of general and natural distrust, and all banks, whether in or outside the country, that have lent money on speculation must suffer the consequences.

The latest advices indicate that the earthquake in Salvador has led to a loss of about \$500,000.

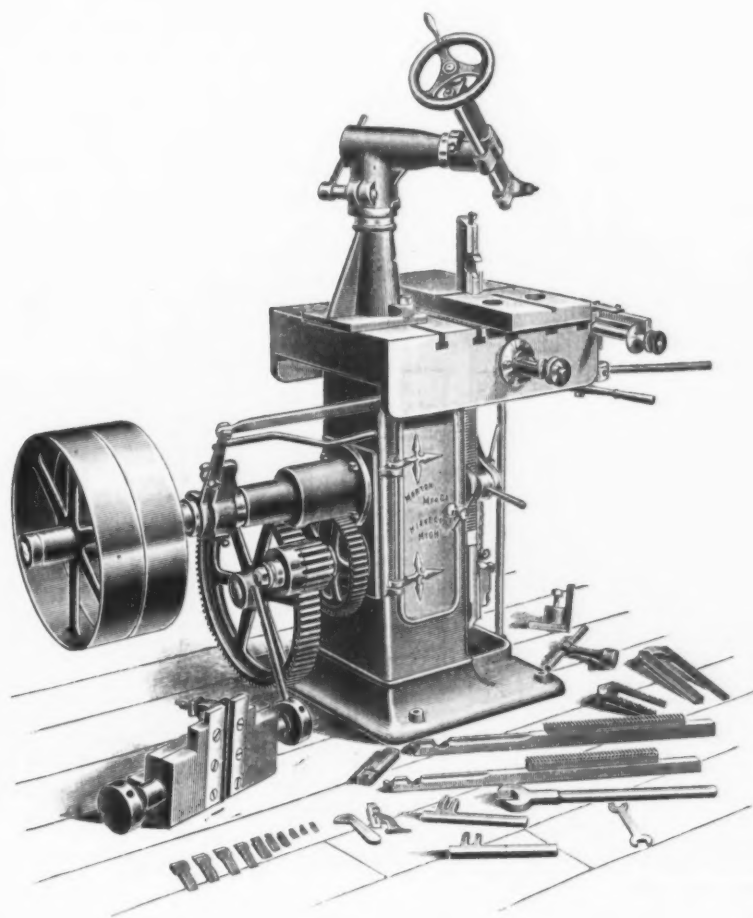


**Morton Key-Way Cutter.**

An illustration is herewith given of a new style of the Morton Key-Way Cutter, with key-making attachment, which has just been brought out by the Morton Mfg. Company of Muskegon Heights, Mich. This machine is built strong and rigid and is designed especially for rapid execution of work. The column is of the box form, with a place for tools, &c., in the inside. One of the main features of this machine, as well as all others manufactured by the company, is the adjustable guide, which oscillates from a fixed journal near the lower end. It makes no difference what position it is in, it gives the tool a straight and parallel movement with the guide. On the front side of the table is a scale and pointer upon which are the gradua-

it perfectly accurate. With this attachment six key ways  $\frac{3}{8}$  inch wide and 5 inches long in hard bronze pinions were cut in less than nine minutes, which was the entire time consumed in placing on the machine, binding down, cutting and removing the same.

The key-making attachment is a feature of this machine which equips it so that a key way may be cut and the key made to fit on the same machine without the use of a file. It consists of an adjustable vise, which holds the iron or steel in an upright position before the cutter, and is so arranged that the taper can be adjusted perfectly and any number of keys made exactly alike. At a trial recently made 138 keys  $\frac{3}{8}$  inch wide by 5 inches long were made and planed on both sides in 117 minutes; also up to 250 keys were made



THE MORTON LIGHTNING KEY-WAY CUTTER.

tions for setting the taper. It is heavily back geared, and has long and large bearings with gearing all cut from the solid. It has a quick return on the up stroke and is provided with three tool bars and tools from  $\frac{1}{4}$  to 1 inch in width and all appliances for setting and operating. The work is centered on the machine by the true bored hole and is not subject to the variation from the rapping of the pattern or uneven places on the casting, and when properly set will cut any number of key ways exactly alike. One of the main features is the ratchet cam movement for fastening the tool bar in the crosshead, by which one tool bar may be taken out and replaced by another size in from 15 to 30 seconds, without the use of a wrench. Another feature of interest is the new patent binding attachment for securing work to the table, which practically does away with binders and bolts, and secures the work in one-quarter the time of the ordinary binders and bolts, and is sure to center the work and make

from rough steel without grinding the cutter, and upon examination the cutter was found good for as many more. The company would be pleased to send to any one interested sample of keys made after making 250 keys without sharpening or grinding the cutter.

These machines have been successfully used for various kinds of work other than key seating, such as cutting racks, ratchet wheels and a great variety of other work which had to be done on slotters. The company's combined portable planer and key-way cutter is a new tool which is designed to do a class of work hard to be accomplished by other means, such as planing rolling-mill housings, facing ends of engine frames, planing cross pillow blocks and planing up valve faces of large engines, stationary and marine, without removing the cylinder; chipping places on large castings and a great variety of work too many to enumerate. The company make a specialty of key-seating machinery, and have just completed and shipped to

the Walker Mfg. Company, Cleveland, Ohio, the largest key-way cutter ever produced, having the capacity to cut a key way 6 feet long and 6 inches wide.

**Another Chicago Elevated Railway Project.**

Last week the Chicago and Evanston Elevated Railway Company were incorporated, with \$2,000,000 capital stock. The incorporators are John Lewis Cochran, De Lancy H. Louderback and Alexander Clark.

Mr. Clark states that the company were formed to construct the southern and elevated section of the Evanston and Chicago Electric Railway, for constructing which a company was formed three months ago with \$500,000 capital stock by the men named above, together with F. S. Gorton and John I. Beggs. The laws of the State made it necessary to take out separate charters for the surface and elevated sections of the road.

The intention is to build a surface electric road, with the Sprague overhead wires and the new noiseless Edison motor, from Emerson street, in the northern part of Evanston, to the corner of Southport and Clybourn avenues, and from this point to run an elevated road along the river, south to Kinzie or Michigan street; thence eastward to the Fifth avenue or Clark street bridge; thence over the top story of the bridge to the alley between South Water and Lake streets; thence eastward to State street.

The whole railway is practically in the hands of the Edison General Electric Company, who have guaranteed its construction. Of its incorporators, Mr. Louderback is General Western Manager of Street Railways for the Edison Company; Mr. Beggs the General Western Manager of the company; Mr. Gorton, who is a brother of Ald. Anson Gorton, is the manager of the Chicago branch of the Edison Company; and Mr. Clark is acting attorney for the company in securing the right of way of the road. J. L. Cochran is the agent of the syndicate which owns Edgewater.

Some time since we referred briefly to the ugly stories afloat concerning the Bochumer Guesstahlverein, who were accused of fraudulently marking rejected material with inspector's stamps. This was vigorously denied by the president of the company, Herr Baare. The records of some of the work are now coming forward. For the Wuerttemberg roads, of 5284 tons of rails delivered since 1876, 0.44 per cent. was exchanged as defective. Out of 3314 tons, 11,195 rails, delivered between May, 1887, and February, 1888, one single rail proved unserviceable. Under five and ten year guarantees there were delivered to German state and private roads 196,376 tons, of which 0.013 per cent. was defective. Out of this whole quantity 66,193 tons have outlived the guarantee, the percentage replaced during that period being 0.329.

Hayti is known as the most turbulent of republics, and now that the trouble in Chili has subsided, a fresh outbreak is expected in opposition to Hippolite. President Harrison in selecting John S. Durham of this city to represent the United States in Hayti and San Domingo, is believed to have acted wisely. The *Philadelphia Press* says: "Mr. Durham is a gentleman of high education, a graduate of the University of Pennsylvania, a careful student of public affairs, long trained in that admirable and exacting school, the editorial page of a daily newspaper, and possessing through his residence at San Domingo complete and intimate familiarity with the affairs on the island of Hayti."

## Oscillating Steam Engine.

This engine, designed by William A. Graham of Carlisle, Pa., is provided with means for reversing the engine and graduating the speed and keeping it uniform. The first object is accomplished by means of an oscillating valve chest and valve in combination with a sliding connection between a stationary part of the engine, the valve axle being so arranged that it can be moved to one side or the other of the axle, thereby permitting the engine to be run in either direction or to be stopped or started at will. Connected with the oscillating

the inside to the outside, and between these ports is the exhaust port 7, the general arrangement being shown in Fig. 2. The usual steam ducts lead to opposite ends of the cylinder, and each port in the valve is adapted to register alternately with one of the ducts and the exhaust port. Steam is supplied through one of the trunnions 11, and exhausted through the other. A segment, 10, formed as shown in Figs. 1 and 3, is bolted to the outer end of one of the bearings. This segment is provided with a hole, through which the live steam passes. The reversing lever 12 straddles this segment and is pivoted at

The bar is composed of two narrow plates with parallel edges secured together at their ends. Thimble 16 has an opening in it a trifle larger than one of these plates and whereby the thimble is loosely mounted on the guide bar, so as to slide freely back and forth. The other end of the thimble extends loosely through an elongated slot, 18, formed in the reversing lever, in relation with which the thimble slides as the lever is swung back and forth to control the engine. There is also a slot, 19, formed in the segment, through which the thimble also passes. This slot is restricted at each end to about

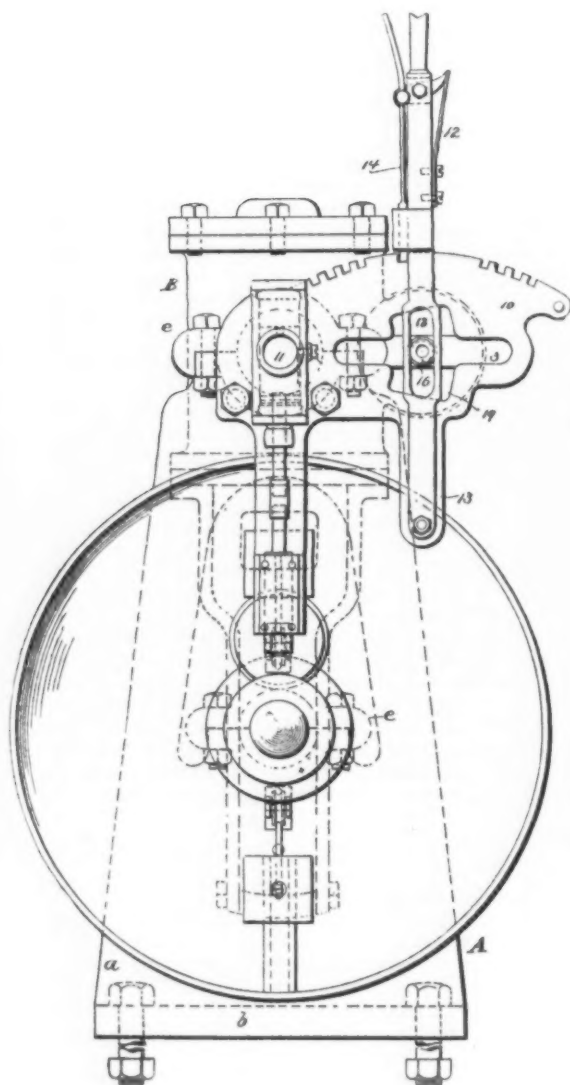


Fig. 1.—Side Elevation.

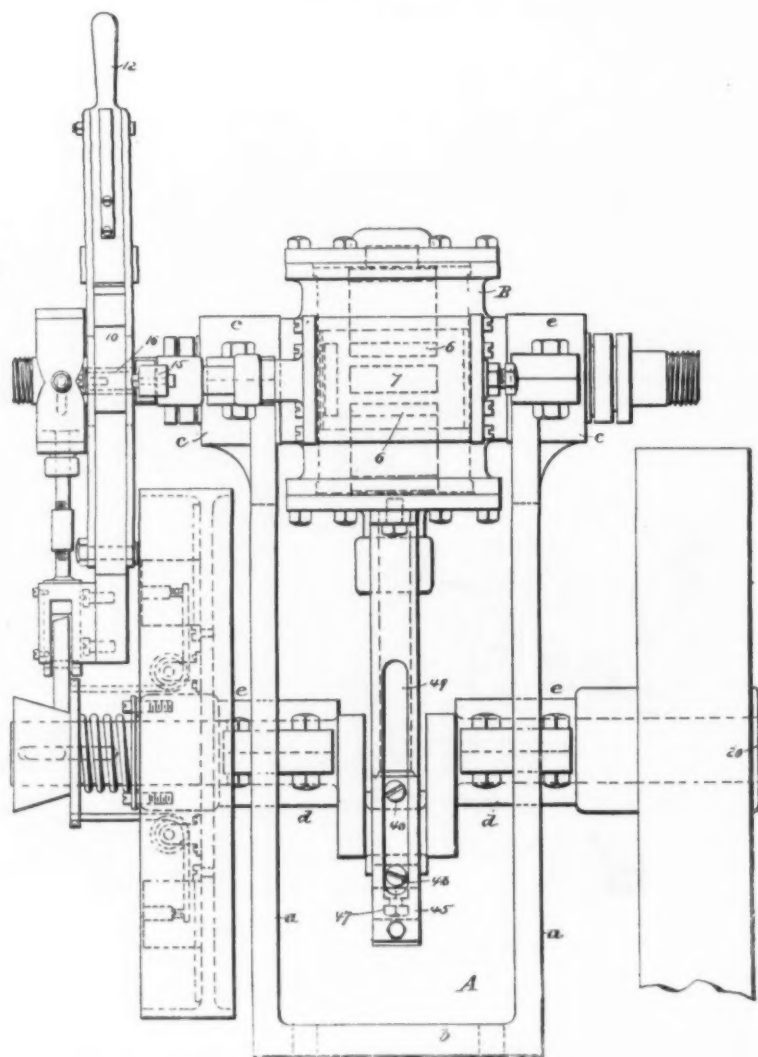


Fig. 2.—End Elevation.

## THE GRAHAM OSCILLATING STEAM ENGINE.

cylinder is a guide frame within which the piston rod reciprocates, this construction obviating all strain, friction and wear on the sides of the piston rod and in the stuffing box.

The frame A of the engine is made in one casting consisting of two standards, a a, connected by the base b and provided with bearings, c d, to receive the trunnions and main shaft. The cylinder B is formed with hollow trunnions, 11, which rest in the upper bearings. A cylindrical valve chest, 3, is located at one side of the cylinder, as shown in Figs. 1 and 3. This has a slightly tapering seat in which fits a valve, which rocks against the seat as the cylinder oscillates. The valve consists of a hollow plug made solid through the middle, where it joins the axle 5, and is formed with recessed ends. Two ports, 6, are made in the valve extending from

one end to the arm 13 of the segment, and carries spring latch adapted to engage with the teeth on the rounded edge of the segment. When the lever is in position for the latch to engage the lower set of teeth the engine is made to run forward, and when it engages the upper set the motion is reversed, and the speed is decreased as the lever is moved further from the center and its speed is increased as the lever is moved toward the axle of the valve, and when the lever is moved so that its center is opposite the axle of the valve the engine is stopped. This is the position shown in Fig. 1, with the latch in engagement with the tooth or teeth at the center of the segment.

The rocking of the valve is regulated by the following means: The axle of the valve is provided with a guide bar, 15.

correspond in width with the diameter of the thimble, so that when the lever is thrown to place the thimble in these restricted portions of the slot, the thimble is confined and prevented from lateral play. Necessarily the center of the slot has to be large to permit lateral play as the thimble approaches the axle of the valve, as otherwise parts would have to break. Now, by means of the lever and its connection with the thimble the rocking of the valve is regulated, the principle of action being dependent upon the length of the radius from the thimble, which is the fixed point or center from which the valve swings, to the axle of the valve, and this change of radius, or, in other words, the length of swing from the fixed center, is effected. In this manner the valve is made to oscillate in the opposite direction from the motions of the cylinder, and thus



the ports and ducts are made to register and close at proper intervals to control the steam and drive the engine.

Reference has been made to a device for relieving lateral pressure, friction and wear on the stuffing box of the cylinder. This consists of a guide frame, 45, secured to the end of the cylinder, and which comprises two plates secured together at their outer ends and arranged to loosely embrace the piston rod, the piston rod being connected with a crank on the main shaft, and as it moves with the crank it strikes the guide and carries it with it and thus oscillates the cylinder, so that, instead of moving the cylinder by the lateral movement of the piston rod against it, this strain is taken by the guide frame.

The strap head consists of a U-shaped yoke and a plate secured over its opening by screws, 46. The boxes are placed in the yoke and held there by the plate, and they are set up against the crank as it becomes worn by a set screw, 47, in the end provided for the purpose. The screws 46 operate

big majority, but never before has there been such a vehement threatening protest from the operatives of the textile industries, who were already angered by the restrictions on child labor and are now in the full spirit of revolt."

#### Gunpowder.

The experiments now making at Sandy Hook with the 12 inch gun have been somewhat delayed because powder of the right kind has not yet been obtained. It is necessary in guns of this description to obtain a specified muzzle velocity without exceeding a certain predetermined pressure. In other words, a pressure of 35,000 pounds must produce a muzzle velocity of 1980 feet per second. A quick burning powder would yield too great pressure and subject the gun to strains not calculated upon, while a slower powder would fail to produce the velocity required. Hence it is evident that somewhere between the two the powder having the proper burning quality is to be found, and it is this problem which the Du Ponts are now engaged in solving. The subjoined description of the Du Pont Powder Mills, taken from the *Wilmington News*, has a timely interest.

A large number of persons who visited the scene of the recent disastrous powder explosion at the Du Pont Powder Mills carried away with them as mementoes of the explosion little six-sided pieces of a black material which they generally supposed to be iron or some soft metal. These mementoes were six sided, about 1½ inches long, 1 inch in diameter, and were pierced by a small round hole. They appeared to be blank six-sided nuts ready to be threaded, to make them available on the bolts of the mill machinery. They appeared to be innocent little things, easy to pilfer and convenient to carry, and served nicely as mementoes of the great explosion. In reality these innocent-looking mementoes are lumps of concentrated explosive energy. They are prisms or lumps of prismatic powder. The name is doubtless owing to the peculiar shape given to each piece or block, which is that of a short hexagonal prism. This form is the result of intense pressure, to which the powder is exposed in its passage through a powerful hydraulic press. It was chosen for the same reason that the honey bee chooses to make the cells in its comb hexagon—economy of space; in building charges for big guns out of this powder the pieces fit snugly together. The compression has put every possible ounce of force into the prism; the small size of the prisms enable the gunners accurately to measure the force of each charge, and the hexagons pack together without loss of space in the load chamber of the gun. In the manufacture of this powder science has learned to ram the charge of powder before putting it into the gun barrel. The concentration of power by means of the hydraulic press is so great that solid prisms of this powder loaded into a gun would probably burst it and it would be wasted by ejection from the gun before it was all burned. The round hole in the prisms of powder, which makes them a complete duplicate of a blank six-sided iron nut, is to secure expansion equally in all directions, and to insure the combustion of all the explosives.

The machines by which these prisms of concentrated power are manufactured are models of compact, strong and accurate-working machinery. One of them now in course of construction stands about 18 feet high, and will weigh about 50,000 pounds. It occupies a floor space 4 feet 4 inches by 3 feet 4 inches, is capable of exerting a pressure of 135,000 pounds on a surface of about 54 square inches in area, and will make 54 prisms of powder at every stroke of its pistons.

The most apparent feature of this press is its weight and strength, and its surprising characteristic is ease of movement and control. It is composed of two water cylinders and two rams, connected by four polished iron rods about 4½ inches in diameter, standing on a rectangular foundation. The cylinders and rams are at opposite ends of these rods. The rams work toward each other centrally with the rods. Between the rams are four cast-iron plates 6 inches thick, 3 feet 2 inches by 4 feet 6 inches in area, three of which move with the ram and one is stationary. This stationary plate is perforated with 54 round holes, about 2 inches in diameter, that have been partially filled with brass bushings. Through these bushings are the six-sided holes in which the powder is compressed. Working directly over this plate is a similar one attached to the ram of the upper cylinder, and guided by the four polished iron rods, which fit into a half-round recess at each of its corners. It is armed with six-sided brass plungers, which in its descent pass into the six-sided holes in the stationary plate. Below the stationary plate is another plunger plate similar to the upper one, and below this is the needle plate. The needle plate is armed on its upper surface with 54 long steel needles, which extend up through the lower plunger plate and into the hexagon holes in the stationary plate. These needles make the round holes in the prisms of powder.

The power of these presses is generated in the cylinders simply by pumping water into them and behind the rams. The cylinders are 11, 12 and 13 inches in diameter. The upper one has two compartments; the ram filling the lower one and above it is a cylinder with a lifting piston, by which the ram is raised after its downward stroke in compressing the powder. The lower ram is raised by pumping water under it, and is lowered by letting the water out, which will be accomplished automatically. In operation the parts of the press are so adjusted that the plungers of the upper and lower plunger plates and the needles approach each other through the movement of the rams. The holes in the stationary plate are stopped on the lower side by the ends of the plungers, and the needles entering through the plungers extend up through the stationary plate. The hexagon holes are then filled with wet powder and the rams brought together, exerting a pressure of 2500 pounds on the powder in each of the holes, compressing it into a solid hexagonal prism 1½ inches long, 1 inch in diameter, with a hole about ⅜ inch in diameter through it longitudinally.

#### Pittsburgh and the World's Fair.

All indications point to the fact that the iron and steel manufacturers of Pittsburgh will be represented at the coming World's Fair in Chicago. Already a number of firms in that city have commenced to think about what they will place on exhibition, and the best way to display their exhibits in order to make them attractive. The Oil Well Supply Company, Limited, manufacturers of oil well supplies of all kinds, will have a large exhibit, occupying a space of probably 60 feet in width by 150 feet in depth. The firm intend to drill two wells on the grounds, one of them an artesian well and the other to be patterned after the manner in which an oil well is drilled. Of course they do not expect to find oil, their object being to show visitors the manner in which oil wells are drilled. At the present time they have an exhibit of this kind at the exhibition of the Pittsburgh Exposition Society, which opened in that city during the present month. R. C. Ripley & Co., glass manufacturers, of Pittsburgh have ap-

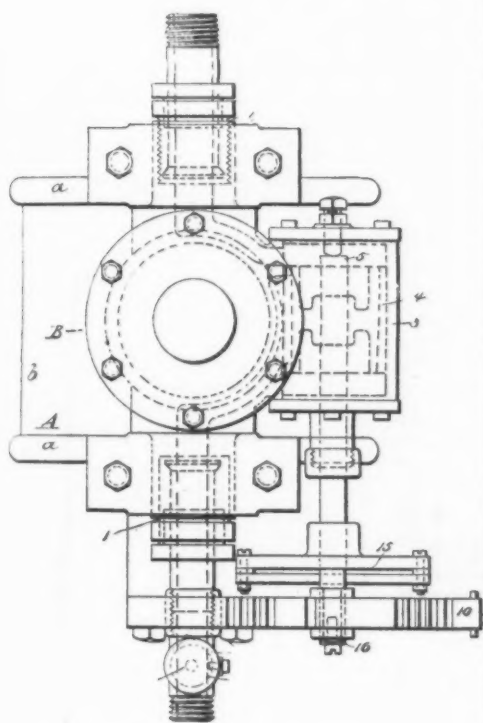


Fig. 3.—Plan.

in a long slot, 49, in the guide frame as the piston rod reciprocates, and in this manner the operation of the parts is rendered more perfect.

The complete operation is as follows: The steam is admitted through one of the trunnions 1 and passes directly into the valve chest, where it is directed alternately to the opposite ends of the steam cylinder. This reciprocates the piston rod, which in turn drives the shaft. The engine is stopped and started and made to run forward or backward by manipulating the reversing lever, as through it the motion of the valve is regulated or its motion prevented.

Harold Frederic, the London correspondent of the *New York Times*, telegraphs that the Trades Union Congress at New Castle appears to have done little but show that the English labor movement has turned a corner and is now losing in both vitality and cohesion. He adds: "There is certainly no such confident tone in the debates as one heard a year ago, and the sessions are marked by an unprecedented amount of dissension and bitter rows. Once more the principle of an eight-hour law has been affirmed by a

plied for space, and will have an exhibit covering all the branches of their business. The H. C. Frick Coke Company, the largest manufacturers of coke in the world,

held in place by adjustable anvils, which receive the strain put upon the rivets when the riveter upon the inside is operated.

designed to support the tube. By this means the tube may be moved along parallel to the rod and so as to travel over the riveting head and maintain the

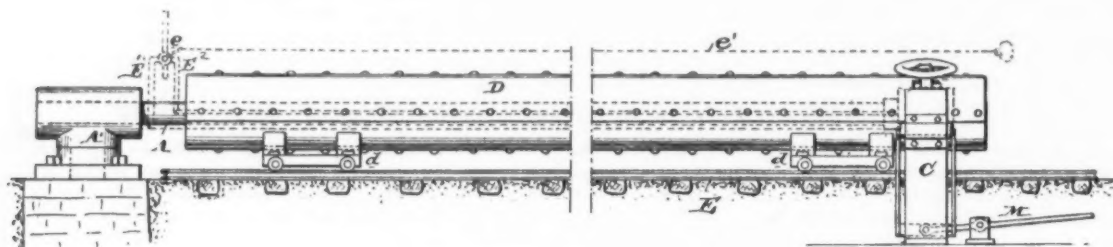


Fig. 1.—Side Elevation.

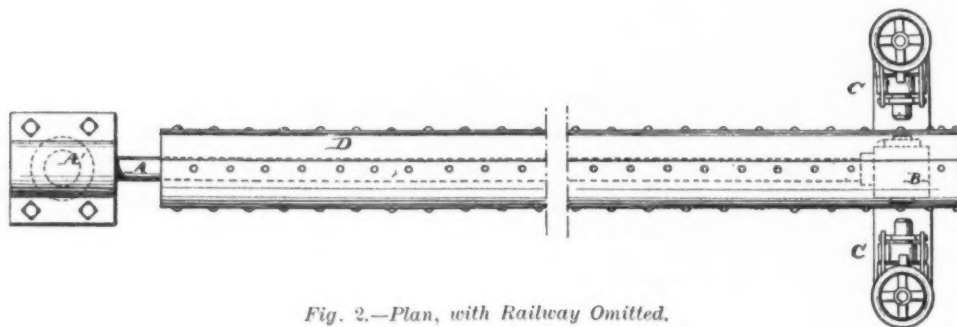


Fig. 2.—Plan, with Railway Omitted.

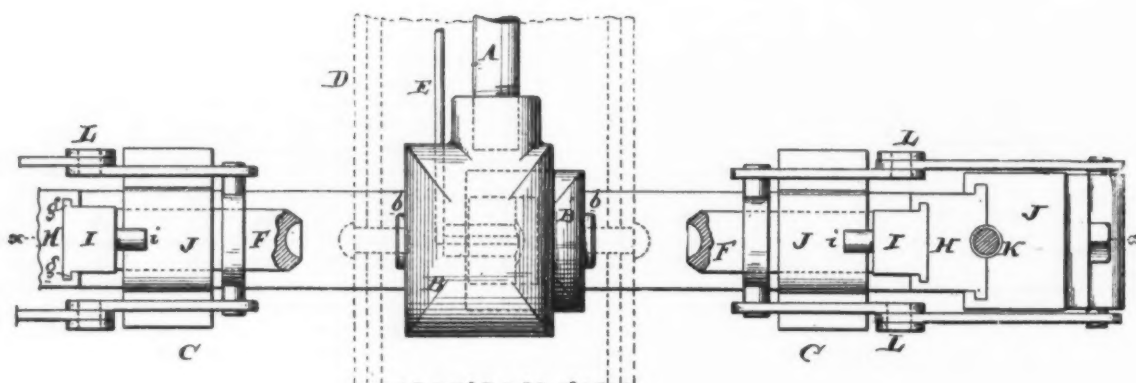


Fig. 3.—Enlarged View of Right-Hand End of Fig. 2.

will also be represented, and will endeavor to show the exact workings of the mines and ovens in the great Connellsville coke district. The Carnegie Associations will also be represented in a very complete exhibit, which will include every branch of manufactured iron and steel. Other firms in that city are also making arrangements for exhibits, and it is expected that Pittsburgh will be one of the best represented cities at the World's Fair of any in the country.

#### Riveting Machine.

The object aimed at by the designer—Geo. H. Pegram of St. Louis, Mo.—of the riveting machine of which we here present drawings, is to produce columns and water pipe at cheaper cost than is now possible. The idea is to take steel plates and bend them in a press to semi-cylindrical shapes, make a tube of two similar segments, run the assembled tube between diametrical drills, drilling two holes at a time, and finally pass it through a riveter, riveting two rows at once. The riveting machine here shown is operated by hydraulic power. It works upon the inside of the tube, the heads of the rivets being held in position from the outside of the tube by suitable mechanism. The rivets are inserted from the outside, and are

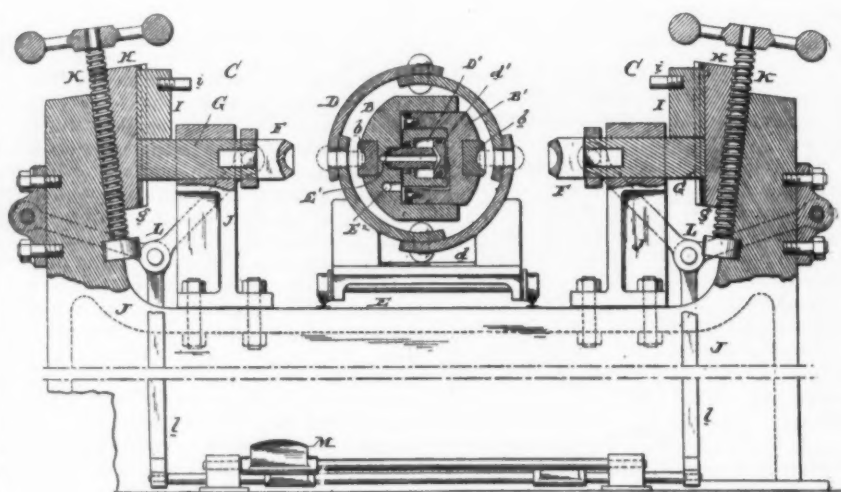


Fig. 4.—Cross Section on Line x x of Fig. 3.

#### THE PEGRAM RIVETING MACHINE.

The horizontal rod A is secured at one end to the bearing A' and supports a hydraulic riveter head, B, at the other end. Below the rod is arranged the railway E, upon which are placed small trucks, d,

series of holes in a proper line to be presented in succession to the riveting dies b. The riveter consists of the main head, in which a piston, B', operates laterally. The head carries one of the dies b and the pis-



ton carries the other dies *b*, the dies being placed diametrically opposite. The piston is provided with an internal cylinder, *D'*, which moves with the piston and works upon a stationary piston, *d*, secured to the head. If water is forced into the port *E*<sup>2</sup> the piston *B'* is forced away from the head *B* and the dies forced apart. If the water is now allowed to escape from the port *E*<sup>2</sup> and is forced into the port *E'* then the piston *B'* with its die is moved into the head. This construction is clearly shown in the sectional view Fig. 4. This reciprocation of the dies is controlled through the valve rod *e'*, Fig. 1, by a valve *e*, arranged adjacent to the support *A'* and connecting with the port pipes *E'* *E*<sup>2</sup>, which extend along the rod *A* to the head *B*. This valve is of the ordinary type, which will allow water under pressure to flow into either port *E'* or *E*<sup>2</sup> and allow the escape of water from the other port.

Arranged upon either side of the head *B*, and supported upon a transverse frame, *J*, are the two anvil mechanisms *C* for

comes between the rear end of the head *G* and the block *H* and receives the thrust put upon the anvil die. Slight adjustments can be made by means of the wedge-shaped plug being moved up or down by means of the hand screw. Before the anvil die can be withdrawn the block *I* must be raised, and then upon withdrawing the anvil die and its head *G* the block will be sustained, as indicated in Fig. 4.

The operation of projecting the anvil dies toward the column on each side takes place simultaneously and is under control of the same foot treadle *M*. As soon as the rivets have been inserted the anvil dies are thrust forward and locked in position. The hydraulic riveter is then operated, and the rivets have their inner ends upset or headed, completing the riveting operation. As soon as this is done the dies *b* are drawn together, and the dies *F* are moved apart. The column is then moved over the railway to the next rivet hole and the operation repeated once more. It is evident that the apparatus can be arranged

as it is delivered from the repeating rolls. The hard rolls set in line and opposite the bull heads, and are so arranged to take the hoop from the bull head as fast as it is delivered from the hard rolls. The aim of Messrs. Bickley is to obtain in hoop rolling results similar to those reached in rod-mill work by Garrett. Experiments made at Dover.

#### Electric Lighting in Cuba.

An extensive arc and incandescent electric-lighting plant has just been installed in Havana by the Spanish-American Light and Power Company. A small plant erected some three years ago proved inadequate, and the present one was projected, with a capacity of 8250 incandescent and 500 arc lights.

This plant was erected in a brick building 195 feet long by 90 feet wide, one story high, and covered with an iron roof. The building is divided into three parts, running the entire length, with a width

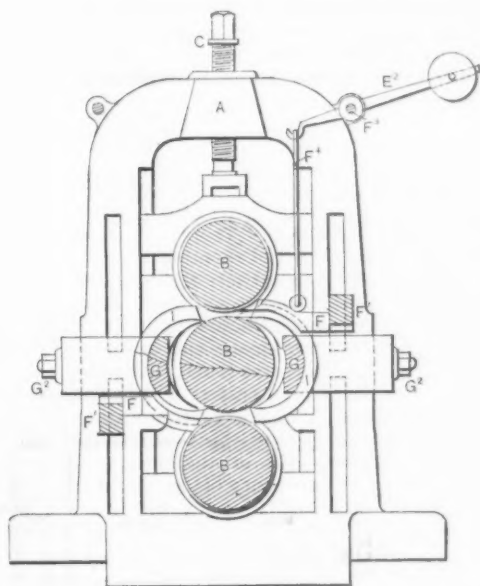


Fig. 1.—Section.

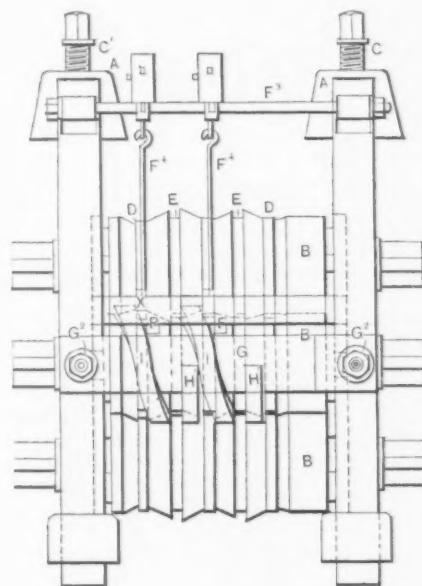


Fig. 2.—Elevation.

#### THE BICKLEY HOOP AND COTTON-TIE MILL.

holding the rivets in place in the tube during the riveting operation. These devices are the same upon each side of the rivet head. The anvil die *F* is fitted to a reciprocating head, *G*, guided in the main frame *J*. The head may be reciprocated by means of a toggle, *L*, which is operated by a link, *l*, and a treadle motion, *M*. When the toggle is raised into a locking position the anvil die will be pressing against the head of the rivet. For various sizes of columns the anvil die may be changed as to its length, and thereby compensate for the difference in space required.

The block *H* has a vertical face adjacent to the head and an oblique face to the rear, working in a suitable guideway on the main frame. This block is moved vertically by means of a hand screw, *K*. The vertical edge of the block is provided with vertical guide grooves *g*, in which is guided a vertically movable locking block, *I*, having a pin, *i*, to strike upon the frame and sustain the block after having fallen to a distance sufficient to act as a thrust or locking block for the head. When the parts are in the position shown in Fig. 4 a movement of the treadle *M* will cause the head *G* to be projected forward toward the column, and upon this operation taking place the locking block, which is sustained by the head before the operation, is allowed to fall by gravity and

vertically or horizontally or at any desired angle.

#### The Bickley Hoop and Cotton-Tie Mill.

John H. Bickley and John H. Bickley, Jr., of Dover, N. J., have designed a continuous cotton-tie and hoop mill, the construction of which is shown in the accompanying engravings. It will be observed that the mill is three-high, the usual adjustment of the rolls *B* with the aid of the screws *C* being adopted. As the billet is entered into the first groove it is bent or curved by the repeater *F* over the apron *C*, and is guided into the succeeding groove by the guide *H*, and so continues to serpentine itself from the bottom to the top and from top to bottom the required number of passes until the strand is finished.

In order to prevent the strand from tangling or buckling there is a weighted automatic take-up not shown in the drawing. On the down side the slack is made to enter a pit, and the slack is taken up by its own gravity. After the strand is finished by this repeating process it is delivered to the bull-head rolls, which set a few feet from and opposite the repeating rolls. The bull heads are proportionately larger in diameter to take up the strand

of 30 feet each. Engine and dynamo rooms are joined by large arches, so that at all times both engines and dynamos are in full view of the person in charge. The boiler room is fitted with four Hazelton Porcupine boilers of 150 horse-power and three 150 horse-power of another make from Baltimore. The engine room has the following engines, all in line: Four 150 horse-power Armington & Sims; one 150 horse-power Westinghouse; three 100 horse-power Armington & Sims; three 75 horse-power Armington & Sims; one 75 horse-power Westinghouse. Both the Westinghouse engines exhaust into separate Worthington independent condensers. The Armington & Sims engines exhaust into the feed-water heaters and then into an underground canal to a brick chimney 150 feet away from the station. In this way all the dirt and noise of exhaust is avoided, and no trouble with backing up of condensed water in the exhaust is encountered. The dynamos are placed in one long room and are as follows: Five 1500-light alternating-current Westinghouse, each self-excited; one 750-light 2000 volt alternating-current Westinghouse, ten 50-arc light 1200 candle-power Thomson-Houston dynamos. The arc lighting is chiefly employed for illuminating the principal streets and public parks, the incandescent lighting for stores, dwelling houses and tobacco factories.

### Petroleum-Oil Engines.

At a recent meeting of the British Association Professor Robinson of Nottingham contributed a paper upon petroleum-oil engines, in which he described a new form of Priestman engine. In the Priestman spray maker and vaporizer a sprayed jet of oil is first broken up by compressed air playing on it in the inverted spray nozzle, then it is further mixed with air, heated and completely vaporized by the hot products of combustion from the exhaust, led around this vaporizer or mixing chamber, before being allowed to escape. This might be called a regenerator. The oil vapor thus thoroughly mixed with air in the proper proportions is drawn through an automatic suction valve into the engine cylinder by the piston in its forward stroke. By the governing arrangement adopted the amount of hydrocarbon is diminished or increased, together with the amount of air, so as to form a highly explosive charge or a low one, according to the amount of work to be done. The air through the wing valve is rightly proportioned to mix with the oil, which is allowed to pass through a V shaped slot cut in a conical plug regulated by the governor. By this means there is a regular explosion and impulse every cycle. The compressed charge is fired by an intermittent electric spark made to play between the ends of two platinum wires insulated by porcelain in the igniting plug and connected to an induction coil excited by a storage cell of about 2 volts.

The author here described a double cylinder vertical launch engine designed specially for running at a high speed. Each cylinder is 7 inches diameter by 7 inches stroke, and arranged to give an explosion or working stroke at every revolution of the wheel. These engines are working with good results in a small launch 28 feet long by 6 feet 2 inches beam. The speed is 7 miles an hour.

The main object desired in oil engines is to prevent clogging in the cylinder, so that the engine may run without attention or frequent cleaning. This is secured by thoroughly mixing the air and vapor, so as always to form an explosive mixture, which gives complete combustion and clean exhaust. During the compression of the charge before ignition a considerable proportion of the vapor comes into contact with the walls of the cylinder, condenses on them, and never gets burned, however useful it may be for lubrication. This was proved by comparing the pressure along the compression curves of the indicator diagrams with the pressure obtained by experiment from each charge consisting of the explosive mixture, 0.015 cubic inch of oil and 191 cubic inches of air at the same temperature. Taking the temperature of the charge, 170° F., on entering the cylinder, the indicator diagram shows the highest pressure before ignition, only 38 pounds per square inch. This is kept low for fear of much condensation, as well as to give smooth running. In the gas engine we know that compression of the charge before ignition is essential to high efficiency, and similar considerations lead one to expect the same to hold true for oil engines. Indeed, by adding fresh air to the charge after leaving the vaporizer, and compressing more than usual, greater power or higher efficiency is obtained, but the temperature of the cylinder becomes too high for lubrication. An engine may be run with a special cylinder liner to withstand the high temperature due to the high compression used, but these are not the conditions for ordinary work. In fact, for any particular oil experience must decide the degree of compression that gives best results as regards power and efficiency consistent with economy and durability of en-

gine. The author next referred to his investigation of the relation between the pressure and temperature of the vapors from different oils. His experiments proved that the law according to which the pressure of petroleum vapor varies with its temperature is represented by a perfectly regular curve for each oil.

By far the simplest type of oil engine is that in which the oil is injected directly into compressed and heated air in a vessel which at once acts as vaporizer and combustion chamber. Such an oil engine is the invention of H. Akroyd Stuart, of Bletchley, and is now being made by Hornsby & Sons, Grantham. A novel feature of this engine is that the ordinary gear for firing the charge by heated tube, flame or electric spark is dispensed with altogether, and heavy intermediate oil is ignited and completely burned when injected into the compressed and heated air of the red-hot vaporizer. This chamber is heated up at start with a special oil lamp supplied with air blast by a small fan. Every charge of oil is forced, by means of a positive action oil pump, through a thin pipe and simple nozzle into the vaporizer at the proper moment for ignition, just after the hot air has been compressed and the piston is on the return stroke. The oil supply is regulated by a governor, while by using a large fly wheel and high speed, about 210 revolutions per minute, this engine runs very steadily. In a 6 horse power engine, during a run of about three hours, using oil of specific gravity 0.854, and flashing point 220° F., the consumption was less than a pint per brake horse-power per hour. Even heavier oils might be tried, the hot water from the water jacket going to warm up the heavy oil and keep it in a fluid state fit for use in winter. The action in the engine cylinder is here very different from that in the Priestman, inasmuch as there is an excess of air in the cylinder, and this is compressed before the oil is injected. Consequently the combustion is rapid and will be complete even when heavy oils of great heating power are used. However, since the air is dry and there is no condensation of oil, the cylinder requires independent lubrication, as in the case of the gas engine.

### Cruiser No. 9.

The next vessel to be launched for the navy is cruiser No. 9, one of three sister ships, of which two are under construction at the Columbia Iron Works in Baltimore, and the third by Harrison Loring in Boston. It is a point of additional interest that these 2000 ton vessels are almost identical in displacement with the two Chilean cruisers *Presidente Errazuriz* and *Presidente Pinto*, built in France, of which so much has lately been heard. The Chilean craft are, however, rather longer and narrower, having a length of 268 feet, and a breadth of 35½ feet, whereas Cruiser No. 9 and her mates are 257 feet on the load-water line, and have an extreme beam of 37, with a mean normal draft of 14½ feet. The latter also are only guaranteed to make 17 knots an hour, whereas the Chilean vessels are 19-knot ships.

Congress, in its act of September 7, 1888, limited the cost of each of these vessels to \$700,000. The first bids on them were not accepted, as they exceeded this amount. At that time, however, the required speed was an average of 18 knots per hour for four consecutive hours. The Navy Department accordingly reduced this limit to 17 knots, and for the former premiums and penalties varying from \$10,000 to \$40,000 for each quarter knot of excess or shortcoming in speed, it substituted a uniform \$25,000 for every quarter knot. New proposals were then called for, and

on October 26, 1889, they were opened. Five firms had bid and all were within the limit in one form or another. The two lowest bids were those of the Columbian Iron Works, \$1,225,000 for two cruisers, making \$612,500 each; and of Harrison Loring for one cruiser, \$674,000. All the bids were for hull and machinery on the plans furnished by the Department. A failure to reach 16 knots rejects the vessel, and in the original proposals this limit had been 16½ knots.

Cruiser No. 9, which is now very nearly ready for launching, is a twin-screw protected vessel, driven by triple expansion engines of 5400 aggregate horse-power, with cylinders of 26½, 39 and 63 inches diameter, and a stroke of 33 inches. The steel boilers, designed for a working pressure of 160 pounds, are of the return fire tubular type, three of them being double-ended and the other two single-ended. The engines and boilers are in separate water-tight compartments. The rig is that of a two-masted schooner. The normal coal supply is 200 tons, with 435 tons as the full bunker capacity, and disposed, of course, so as to protect the machinery. A water-tight protective deck extends the whole length of the vessel; but especially interesting is the coffer dam protection along the entire machinery space, to be filled with cellulose. This vessel will be the first in our navy to carry this water-excluding belt, whose efficiency has been practically tried in several navies, and notably of late in the Danish vessel *Hekla*. There the thorough test was applied of shooting a projectile from a heavy gun entirely through the cellulose belt at the bows, and then steaming around for several hours, after which the water taken in prior to the automatic closing of the hole was found to be only about 1 gallon.

The battery will be composed wholly of rapid-fire breech-loading rifles—probably eight of the 4-inch caliber and two of the 5-inch or the 6-inch. There will be a secondary battery of smaller rapid fire and machine guns and also six tubes for discharging auto-mobile torpedoes. These vessels will be the first of our war ships to carry rapid-fire guns in their main batteries; they will be the first to be provided with cellulose belts, while as to their machinery, it is enough to say that the engines of cruiser No. 9 are to develop 400 horse-power in excess of what was assigned to the *Chicago*, a vessel of two and one-quarter times her displacement.

The contract for the two Baltimore cruisers of this type calls for their completion next May, and the Boston cruiser also is to be finished a little later in that month.

The *New York Journal of Finance* publishes extracts from a letter which, it is said, was written lately to a family connection by Baron J. Rothschild. The letter says: "For the investment of the sum of money you name I can recommend chiefly the advisability of buying American railways. Here you will find the maximum of probable profit and the minimum of risk. During the unhappy circumstances that have demoralized the whole financial world during the year past, America has loomed up almost alone unharmed and stalwart. What has damaged the rest of the world has largely, indeed, been to America's advantage."

The Bowdoin Labrador exploration party reports that the Grand River Falls measure 200 feet and that the rapids leading to it increase the total to 500 feet. Above the falls the average width of the river is 500 yards, narrowing until it reaches the falls to a width of only 50 yards, when it plunges with a terrific roar over the rapids and falls into the narrow gorge below with great velocity.



## THE WEEK.

The crack ships of Lake Michigan, the Virginia and the City of Milwaukee, are having a keen struggle for supremacy on that lake. For the present the latter ship, which is a side-wheeler, has made the fastest passage.

The scheme for allowing the import of American cattle for slaughter into Canada, for which application has been made by the Three Rivers Abattoir Company, has met with official opposition.

Baron Hirsch is at the head of the Jewish Colonization Association, with a nominal capital of £2,000,000, of which one-half is to be applied to accruing property, buying lands, erecting buildings, &c. The rest is to be used to cover expenses of transportation and otherwise assisting Jewish emigrants. These Jewish colonies are to be established in North and South America for agricultural and commercial purposes.

By a recent order of the Government all the theaters and places of amusement in Havana are to be lighted with incandescent lamps, failure to comply forfeiting the license.

The estimate of the world's population in 1890 is as follows: Europe, 380,200,000; Asia, 850,000,000; Africa, 127,000,000; Australasia, 4,730,000; North America, 89,250,000; South America, 36,420,000. Total, 1,487,600,000.

Official reports show that the mining of coal is progressing very rapidly in India. During the fiscal year ending March the output was 2,750,000 tons, against a little over 1,250,000 tons in 1886. The imports by sea have declined from 849,000 tons in the latter year to 460,000 tons in 1891. Bengal is at present the chief coal-producing district of India.

Recently four oil wells in Pennsylvania were producing at such a rate that nearly 10,000 barrels a day were being wasted. At that time the Elliot, the Matthews, the Baldwin and the Miller wells were each producing 4000 barrels a day.

The *Commercial and Financial Chronicle* has issued its estimate of the movements of cotton for the last commercial year. Up to August 31, 1891, the receipts of cotton aggregated 8,655,518 bales, of which 5,790,634 bales were exported. Great Britain took thereof 3,318,004 bales, France 561,246, and the Continent 1,930,384 bales. Southern spinners used 605,916 bales, while north of Virginia the consumption was 2,031,625 bales, showing steady progress.

Montana claims to have sold this year 80,000 head of cattle at an average net price of \$30 a head, and the shipping has only just begun.

Terrorite is the name of the newest high explosive with which the Government is making experiments. It is said to have more power than dynamite, and to be much safer to handle, being unaffected by jar or shock. Should the new force realize the confident claims of its inventor it would come most opportunely to supplement the new 12 inch rifled mortars.

The population of Guatemala is 1,460,000.

It is announced in Liverpool that the Cunard Steamship Company have decided to build two new steamers for the Boston trade in addition to the two new vessels which that company will build for their New York trade.

President Harrison has recognized the Chilean Junta.

The Treasury Department has authorized the allowance of the usual drawback

on imported tires and retaining rings used in the construction of exported locomotives made in Providence, R. I.

Honduras exported during the fiscal year \$2,667,000.

The steamer Zulu has arrived at Boston from West Bay City, Mich., where she was built. She has been constructed expressly for carrying and towing mahogany logs down the river to Nicaragua, Central America.

The rice crop is now being harvested throughout the entire section of the country contiguous to Savannah. It is estimated that the crop will amount to 650,000 bushels, as compared with 480,000 bushels last year.

The reciprocity agreement between the United States and Brazil went into effect on April 1 of this year. A study of the statistics for the month of June, 1890 and 1891, reveals that the exports from the United States to Brazil increased from \$505,999 to \$999,959. The principal increase was in flour, which rose from \$229,587 to \$419,131.

The Pennington balloon, after several ineffectual attempts to ascend, is found to be weighted down by a heavy mortgage.

The city of Watertown, in South Dakota, has 6000 inhabitants. It is in a fertile valley on the shores of Lake Kompeka, and the prediction is made that its manufactures will rival those of Minneapolis and Omaha in a few years.

Minneapolis declines the overtures of St. Paul for a union of the two cities on the ground that the latter is too much burdened with debt. St. Paul was "sat down" on, but not crushed.

British commerce shows a contraction in the export trade, mainly due to the falling off in tin plate.

Knights of Labor in Pittsburgh have taken preliminary steps toward the organization of a builders' exchange, composed of members of the building trades unions, as a rival of the Master Builders' Exchange.

Nine-tenths of the petroleum trade of Philadelphia is in the hands of the "tankers." Sailing vessels are only chartered to load oil for the out of the way ports, where facilities for the discharging of the tankers are not offered. The wharves about the various refineries are lined with the ugly, unsightly "tankers."

Canada is struggling with a big conundrum. The census takers fail to find nearly 900,000 immigrants which the Customs Department reported to have settled in the Dominion, and as the United States do not claim to have received more than 600,000 Canadian refugees the puzzle is to account for the discrepancy. A Montreal paper thinks the census ten years ago must have been erroneous.

A Texan proposes to start a raft of pine logs from Galveston harbor to London some time next summer.

The London *Post*, referring to the recent disorders in China and disregard of treaty rights, says: "These rights must be enforced or renounced; and in regard to the passage of the Dardanelles by a Russian war ship, which was represented to be conveying only peaceful laborers, Turkey is reminded that Russia possesses no privilege to which other nations are not equally entitled."

The German-American League of Technologists, in session in Boston, on Saturday voted to indorse the recent action of the American Meteorological Association to petition Congress that on and after July 1, 1893, the metric system of weights

and measures authorized by the act of Congress, approved July 28, 1866, shall be used exclusively in the Customs service of the United States.

Judge T. M. Cooley of Michigan, chairman of the Interstate Commerce Commission, has sent his resignation to the President. He had served as chairman of the commission ever since its organization.

An interesting work that is now in progress in Glasgow, Scotland, is the construction of three tunnels under the harbor from shore to shore for the accommodation of teams and foot passengers. These tunnels are 16 to 18 feet in diameter and are circular in section. They are side by side, and only 2 feet apart, and about 15 feet below the bottom of the river. The tunnels will be about 720 feet long, and will be reached at each end by elevators in pits about 80 feet deep. The work is to be finished next year.

Deep interest is felt in the opening for settlement at an early date of the tract recently purchased from the tribes of the Eastern border of Oklahoma. The region is like that of Oklahoma, watered by the same rivers, and contains some good farming country. The old section is said to comprise 820,000 acres.

It is intimated that the present intention of the Navy Department is to confine its demands for new vessels during the coming session of Congress to torpedo gunboats, torpedo-boat catchers and small gun vessels.

The success of the whaleback steamers is bringing out a number of proposals similar in character. Among them is one designed by a marine engineer of Toronto, named Redway, who has constructed a model of a new style of craft.

A sugar school has been established in New Orleans under the auspices of the State and the Louisiana Agricultural and Scientific Association. The object is to offer facilities to take a course in the culture of cane and in the manufacture of sugar from it. It has a plantation attached with a small sugar house.

Yale College will soon open its academic year with the largest number of students on record. It is believed that the whole number will not fall short of 1800.

Recent experiments indicate that aluminum has found a very promising field of usefulness in the construction of musical instruments. It is reported that sounding boards made of cold rolled aluminum yield tone of exceptional quality, especially in the upper registers.

During the three years 1887, 1888 and 1889 the diamond mines at Kimberley, Griqualand West, South Africa, produced 10,074,713 carats of diamonds, valued at £11,963,964. The four leading mines are the Kimberley, with a record in three years of 3,482,776 carats; the De Beers, with 2,964,649 carats; the Dutoitspan, with 1,715,925, and the Bultfontein, with 1,803,434 carats.

Comptroller Lacey's circular to about 45 national banks, notifying them that they cannot hold matured 4½ bonds (unextended) as a basis for circulation, is based on a precedent established by Secretary Sherman and Comptroller J. J. Knox during the Hayes Administration. They interpreted the law as meaning that circulation could not be based on non interest bearing bonds. The unextended 4½s have, of course, ceased to bear interest, but some of the banks, evidently thinking of retiring or reducing their circulation in a few months, do not care to go to the trouble and expense of extending the 4½s or of buying new bonds, and thus are willing to lose the interest on the matured 4½s for awhile. But Comptroller Lacey has put a veto upon this.

# The Iron Age

New York, Thursday, September 17, 1891.

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RICHARD R. WILLIAMS - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

## A Chicago Iron Exchange.

The question of establishing an iron exchange is being agitated in Chicago. As the outlook is now very favorable for an active trade in iron and steel and all kinds of railroad specialties for the next year or two, the present is regarded as opportune for carrying out a scheme of this kind. Thus far the matter has not taken definite shape, but there are a number of enthusiastic advocates of such an institution who are assiduously endeavoring to promote a favorable sentiment toward it. The need of some common meeting ground for buyers and sellers of railroad material is shown whenever there is even a slight spurt of business. The rotunda of the Grand Pacific Hotel has grown to be a favorite resort for many members of the trade, who gather there daily to pick up the current news and to come in contact with other business men. No other public place in Chicago attracts so many iron and steel buyers and sellers, and numerous transactions are at least begun there which may afterward be completed in private offices.

It is assumed that if a suitable location can be found in the vicinity of the Board of Trade it would be visited by these business men daily between, say, 12 and 2 o'clock, if they thought the place would become popular. There has been no suggestion that an attempt should be made to sell any particular commodity in public, but the idea sought to be accomplished is merely to provide a recognized meeting place where railroad purchasing agents and other officials may be brought into contact with the numerous sellers of materials. The builders and traders of Chicago have a very successful exchange which they have conducted for a number of years, and it has been found to be a great convenience in the building trade. As Chicago is the greatest railroad center in the world, it would seem to be the place in which an exchange for transactions in railroad material could also be successfully operated. Other iron and steel interests would naturally fall in line with the railroad interests. There is no question but that such a meeting place would be found very convenient, provided it should prove acceptable in every respect to the trade. This is the doubtful point, which could only be settled by actual test, which would, of course, have to be made under very favorable conditions, both as to the place selected as headquarters and the individuals who would be the sponsors of the project.

## The Western Stove Trade.

One of the first branches of the iron business to be affected in a marked degree by the improved condition of the farming interests is the stove trade. Personal investigation the past week among stove manufacturers and dealers in the West discloses the fact that the demand for stoves is thus early of unusual proportions. Without an exception they report that the volume of business is not only in excess of that of recent years, but in numerous instances it exceeds anything known since the boom of 1880 and the flush times of the years immediately following. The improvement in trade is set forth in various ways by the different manufacturers who have been interviewed. One says that it has been found necessary to provide an electric light plant so that the foundry could be run well into the night to get the work out fast enough. Another states that salesmen have been called in from the road to help the shipping department. Another says that the condition of trade is directly the reverse of last year and the year preceding, when repairs constituted a very large percentage of the trade, showing that people generally were trying to patch up their old stoves, whereas now the demand runs almost entirely to new goods. Another reports that first shipments of stoves are being closely followed by fresh orders, although the weather has not yet been cold enough to alone warrant such a demand. Another reports warehouses being rapidly emptied of their contents. Not a few express the opinion that if cold weather sets in reasonably early there will be an actual scarcity of stoves.

There is reason to believe that some of these statements are a little more highly colored than actual facts would warrant. But stove manufacturers should be excused for feeling exuberant over the prospect of a heavy trade this year, when one takes into consideration the succession of lean years which they have passed through. Excessive competition for business has almost wiped out manufacturers' profits, and besides the past three winters have been so unusually mild that the demand for heating stoves was far below all expectations. Poor crops and low prices cut down the purchasing power of farmers at the same time, and to crown all, other forms of heating apparatus have been taking the place of stoves to a considerable extent. The appearance of an actual, legitimate, old-fashioned demand for stoves is therefore excellent cause for rather exuberant expressions.

A significant feature of the current fall business in stoves is the tendency among buyers to take goods of the more costly patterns. This shows as much as anything that the slack demand for stoves of the past several years was largely owing to the poverty of the farmers. When they are favored with good crops or with high prices for their products they are liberal purchasers, and they do not hesitate to take the best of what is offered. They are perhaps more inclined to this policy now, as they observe that they are able to get a

superb piece of heating or cooking apparatus at as low a price as would have been charged them for greatly inferior goods but a few years since. Manufacturers cannot help but mourn the departure, perhaps forever, of the days when they were able to make a handsome profit on everything going out of their foundries.

The excellent opening which the stove trade has made is an indication of what must soon be expected in other branches of the iron business. Liberal buying will not be confined to one class of goods. The demand will be general. As it is based on the condition of the consumer, some little time may elapse before the effect is felt beyond the first point of contact. It will eventually be communicated along the whole line, however, and the wave of prosperity now in sight will bring a time of welcome relief to those who have been staggering under weary burdens.

## Allotting Floor Space to Machinery.

The value of providing each machine with a floor space amply adequate for all purposes is acknowledged by every manufacturer who has had the privilege of designing new works. But for some unexplained reason the true benefit to be derived is not appreciated. Old establishments will worry along with all the men touching elbows, and when compelled by pure force of circumstances to enlarge, provide but little extra space for each machine. Having become accustomed to cramped quarters it seems impossible for them to realize the advantages directly arising from plenty of room. It would appear that a wrong view is frequently taken of the question—some looking at the outlay as an aggregate, instead of considering the additional expenditure as a certain sum to be met daily. That work can be performed more cheaply and more accurately in a shop of ample size than in a small one will be conceded, and yet why do we find so many rooms filled to overflowing with machines of every description? In order that a machine may be run to the utmost limit of its capacity it must have a floor space sufficient for the convenient storing of all its attachments and for the placing inside of it of the next piece of work and of the finished work, and especially its operation must in no case be interfered with by the requirements of any of its neighbors. Plenty of room is the only way of attaining this end. The exact amount of space to be allotted each machine is not the question we now wish to discuss. Taking the cost of floor space at \$1 per square foot, will it pay to apportion to a certain machine a space sufficient under all conditions? To give a machine 100 square feet extra means, in the eyes of the average owner, a direct expenditure of \$100. The matter should not be viewed in that way. The \$100 means \$6 per year, which may be considered as rent to be paid by that machine for the increased advantages to be derived from the enlarged room. This \$6 is 2 cents per day for



the 300 working days, and the real problem to be solved is, Will this additional 100 square feet furnished that machine result in the saving of 2 cents per day, or \$6 per year? That the output will be augmented and the quality enhanced far beyond that will be granted. Even a single job might save much more than the yearly amount. The whole question does not have so formidable an aspect when the interest charges on the outlay are thought of, and not the sum total. And yet this country abounds in crowded shops.

### The Steel Rail Trade.

Thus far those who have been expecting an early revival in the steel rail trade have been much disappointed. Even the most cautious expected before now to observe the first indications by the appearance of renewal orders, so long delayed on account of the poor financial condition of the majority of railroad companies. We believe that few realize even now in what straightened circumstances so many railroads were and still are. The revelations concerning the Union Pacific and Richmond Terminal companies have singled them out, but it is quite generally understood that a number of other railroads have received the helping hand of friendly syndicates in the nick of time. Rail makers, during the past few months, have suffered more anxiety through the difficulty in getting their money for rails delivered than through the impossibility of placing new orders. The Southern railroads particularly have been the source of so much trouble in that direction that large concerns with few exceptions will not sell to Southern roads. Still, even the least sanguine have expected better business than has yet shown itself. A good many hoped to witness a rush of small orders for prompt delivery to take care of track which had been allowed to deteriorate so far that repairs must be made before the winter. Thus far even this business has not appeared, and there is little chance that the mills will do better for the balance of the year.

According to the report of the Board of Control, the sales of standard rails up to September 1, for this year's delivery, figured up 896,798 gross tons, so that during the whole of August the sales aggregated only 36,000 tons, while they were 52,000 tons in July. The shipments, which had been 454,423 tons up to July 1, reached 584,938 tons a month later and 699,027 tons on September 1. In the two months, in which the new orders figured up 88,000 tons, the shipments were 245,000, leaving only about 200,000 tons of orders to be rolled in the last four months of this year, not counting any new work which might be secured during that time. To keep up the rate of running during July and August, when the Western mills were driving fast and the Eastern mills were running slowly, it would be necessary to secure orders aggregating 300,000 tons for 1891 delivery. We do not believe that any such quantity will come into the market.

Considering these facts, the conclusion seems warranted that the revival of the rail trade, which we confidently expected, cannot come before the beginning of next year. We believe that this cannot fail to have its retarding influence upon the rise in prices fully anticipated in other leading lines of iron and steel manufacture. Even now it has its influence, and may explain the apparently inexplicable weakness in soft steel and in Bessemer pig iron, notably in the West. The large rail mills, with their enormous product of pig iron, not finding an outlet for it in the form of rails, are pushing it into billets, which in turn affects wire rods, wire and its products, plates and cut nails. If they do advance in price during the balance of the year, it will be in spite of the influence of a slack rail market.

### Stocks of Pig Iron.

Very complete returns show that the quantity of iron in the yards of the coke and anthracite blast furnaces of the country has increased during the month of August, while the charcoal producers, on the other hand, have unloaded their stocks to a considerable extent. Among the coke and anthracite furnaces the increase has been due to the stacking of iron by a large number of furnaces which have heretofore kept sold up, while the same number of charcoal stacks as at work August 1 report a slight decrease in holdings. Thus 48 charcoal stacks, 9 of which were idle on the 1st inst., whose combined weekly capacity is 11,523 tons, report a stock of 152,774 tons, against 50 furnaces and 163,631 tons last month. To this amount 11 active and one idle stack in Michigan contribute 75,970 tons, the four producing charcoal furnaces in Wisconsin report 25,074 tons on hand, while the greater bulk of the remainder, or about 38,000 tons, is distributed among the yards of Tennessee, Alabama and Georgia.

Anthracite furnaces to the number of 52, of which 11 are out of blast, capable of producing 18,095 tons per week, hold 149,227 tons, as compared with 41 furnaces and 93,694 tons on August 1. The increase is notably among the larger producers, who appear to be stacking iron rapidly. New York leads with 45,365 tons closely followed by New Jersey with 43,490 tons.

During the month under review more coke furnaces have come into the field as holders of iron, increasing the aggregate considerably, although the average per furnace remains about the same. On September 1 109 active and 14 idle furnaces, having a weekly capacity of 102,133 tons, carried 193,828 tons, against 154,128 tons and 102 furnaces last month. The Shenango Valley in Pennsylvania leads the different sections with 21,367 tons, held by ten furnaces, followed by the Allegheny and Youghiogheny valleys with 16,889 tons, Mahoning Valley, Ohio, with 16,678 tons and Allegheny County, Pa., with 16,583, the latter amount being in the yards of seven producing furnaces. The South also contributes largely to the available supply of iron, Alabama reporting the greater amount.

Reports from Kansas City indicate that some of the railroads in Kansas are at times congested with the enormous flow of wheat to market. In some sections the switches are filled with loaded cars awaiting transportation. Thus far, however, blockades are only temporary. It is predicted that when the real rush has begun far more serious trouble may be experienced.

## CORRESPONDENCE.

### Curved Arms in Pulleys.

*To the Editor:* Replying to comment by "T. H." on the article published in *The Iron Age* August 6, it is not clear as to which portion of the passage quoted the objection is made, there being two distinct propositions involved. The sentence reads: "*Considered as an overhung beam, the curvature adds to the length, and therefore reduces the transverse strength in proportion to the increase in length.*" (The italics in the quotation are used to emphasize the two propositions referred to, and do not occur in the original.) That the arm may be considered as an overhung beam, fixed at one end and loaded at the other, is certainly true. Which end is fixed and which loaded depends on whether the pulley is used as driver or driven. If the former, the strain is applied at the hub, and the point of resistance is at the point where the arm is fixed to the rim. In case of the driven the reverse obtains, the hub end being fixed and the rim end loaded. No further demonstration of the proposition is needed than to eliminate all extraneous members and consider the arm alone, with reference to its function of transmitting the strain from hub to rim or *vice versa*.

With reference to the second proposition there can be no question that a curved line between two given points is longer than a straight one—witness, the arc and its chord. Nor is there any doubt that a curved beam and a straight one placed side by side, fixed on the same support and equally loaded at the same distance from point of support, will deflect in proportion to their respective lengths. These are precisely the conditions which obtain with reference to the pulley arm. Of course it was not intended to convey the idea that there is any lessening of the actual strength of cross section of the arm, which would be obviously absurd, but that its greater length with the same leverage and load would render it proportionately weaker as a whole. G. T.

### The Pittsburgh and Mexican Tin Mining Company.

*To the Editor:* Agreeable to a promise, I give you some facts regarding the Pittsburgh and Mexican Tin Mining Company. The main stockholders of this company are Gen. Charles L. Fitzhugh of Pittsburgh, Mr. James McCormick, George H. Thurston, A. H. Childs and some others, whose names I cannot recall. John R. Williams of Chicago owns some of the stock, and I have a large block of it myself. Col. Robert H. Fitzhugh, the brother of General Fitzhugh, is general manager of the company. The corporation have under concession from the Mexican Government about 240 square miles of mineral land containing rich deposits of tin. Over 100 veins of tin ore have been uncovered, carrying anywhere from 5 to 60 per cent. of metallic tin. There are six mines already opened, and three of them in operation yielding 60 tons of ore per day. Additional reduction and smelting capacity is now under construction. The mining is still conducted on the primitive Mexican plan, the ore being carried from the workings on the shoulders of the native Mexicans. Labor is cheap. The mill now in use has a capacity of 100 tons per day of ten hours. The ore is soft, and requires no blasting, being carried in rotten porphyry.

Two smelting furnaces are in operation, producing each 1 ton of pure pig tin per day, as good tin as can be found anywhere on the globe. Lime for fluxing is found near the reduction works. Additional smelting furnaces will be built, enough to increase the output to at least 1500 tons

per annum. One carload of the tin has been shipped to Pittsburgh, and I believe this is the first shipment of tin amounting to anything produced on the American continent. The tin found and reported upon by Colonel Fitzhugh is the true fissure vein with well defined walls. The three developed mines or what might be called "going concerns" are the Taltomates, the San Miguel and Grant, the San Miguel being the widest and containing the highest percentage of tin. The title to the property is secure, and considering the disadvantages labored under a large amount of work is being done. The right to begin work by the Federal Government of Mexico was granted in July, 1890, and the location being accessible only by pack trains, roads were required to be built, which was done very quickly and the first wheeled vehicle passed the mountain barrier. The machinery was shipped from Pittsburgh, and the delay in getting it on the ground was long and vexatious.

Prospecting, mine opening and construction were carried on together. The work has been done in a business like way and by people who are not speculators. There is no question in my mind and in the minds of people who are familiar with the matter that the Pittsburgh and Mexican Tin Mining Company have a valuable estate and which is likely to be lasting. The company are entirely out of debt and have money in the treasury and are not encumbered in any way. Yours truly,

J. G. BUTLER, JR.

YOUNGSTOWN, OHIO, September 12, 1891.

#### Southern Basic Steel.

To the Editor: It has been with much interest that I have read the valuable contribution in *The Iron Age* on steel manufacture in the South by the duplex Bessemer converter open-hearth process. While this process appears to be quite popular with the writers, I do not believe it will ever be successful in bringing the South up to that position in the steel producing world that I believe it is entitled to. Now, while I believe that this process is practicable and to a certain degree suited to working Southern iron, I do not believe it can ever be a financial success. In the first place, its first cost of plant per ton of capacity when compared with other processes condemns it at once. The great amount of extra labor necessary, coupled with a certain degree of uncertainty of quality of product, does not commend it as being the only process to be recommended to the Southern ironmaster. The duplex converter process in my judgment is the only known process that could be adopted with any hope of financial success by the Southern manufacturer.

This process, of all others, is best suited to working irons of the quality peculiar to the South. Southern irons contain so great an amount of phosphorus that they are unfitted for the acid process, and so small an amount that they are equally unfitted for the direct basic process. In the duplex process these conditions are just what would be most desired. This small amount of phosphorus means short blows in the basic converter, which reduces the wear on the linings and at the same time reduces the amount of lime additions. Since the amount of phosphorus is low and uniform, the product will, of course, be likewise more uniform than is possible when that element is present in large and irregular quantities. Again, the cost of plant per ton capacity would be much smaller than by any known process working irons of the same quality. Furthermore, as the amount of lime additions would be much less, the cost of production is reduced. At the same time it admits of more rapid working than is possible in any other basic process, which means a larger and cheaper product.

Another feature that should be looked upon with much favor is that this process does not differ greatly from the regular acid Bessemer process, which means much in its favor, and doubtless would save many thousand dollars in starting a plant of this kind.

In regard to cost of plant, I do not think it would be extravagant to say that a plant could be built and equipped for a product of 600 tons of finished blooms or billets per 24 hours for \$350,000, or about \$25,000 more than an acid plant of same capacity. By adopting this process the Southern steel manufacturer would be greatly in advance of his Northern competitor using the acid Bessemer process. This assertion may appear a little highly colored, but when it is known that irons with as low phosphorus as would be necessary to produce steel with as low phosphorus as could be made by this process commands from \$1 to \$3 per ton more than ordinary Bessemer pig made from the best lake ores, it does not appear quite so overdrawn.

The only point on which there has been any difficulty—in fact, the only difficulty—has been the loss of heat in transferring from the acid to the basic converter, which alone, I am informed, caused the abandonment of the process in Europe. Now, to a practical steel man this is a small matter when it is known that almost any degree of temperature is attainable in the Bessemer converter by the addition of fuel in the cupola, or silicon in the converter, and this without in any way interfering with the working of the basic converter or the complete elimination of the phosphorus. Just why Southern manufacturers are so slow in adopting this process I cannot comprehend, unless it is the great cost the majority of writers would have them believe to be necessary for erecting and starting a plant of this kind. With Southern irons at present market prices, converted by the duplex converter process, there is no country in the world that could compete with the South in the manufacture of steel of any grade or quality, and I only await the adoption of this process to prove the correctness of the assertion.

#### DUPLEX BESSEMER.

#### Electricity at the World's Fair.

The special report by John P. Barrett of the work of the electrical department since its organization shows that up to the present time specific applications for space, including particulars as to power, &c., required, have been received from 30 firms or individuals aggregating a demand for 55,377 square feet of floor and wall space.

Mr. Barrett says: "In addition to these I have tentative or preliminary applications from 43 firms or individuals aggregating a demand for 62,300 square feet of space. These applicants have not been able as yet to decide precisely as to their requirement, and await at the present time certain information at the hands of this department. We have heretofore been unable to furnish this information. Still, in addition to these applications, I have letters from 59 concerns notifying the department of their intention to exhibit, but who have up to the present time failed to go further than such notification; their demands for space, however, will aggregate 75,000 square feet. These applications represent a total demand for 192,677 square feet of space in the electrical building. The larger concerns of this country have failed to send in their applications, but the work of preparation for the exposition is well under way in their factories. They require, before applying for specific space, certain information as to the supply of power, lighting, &c., for the exposition.

As soon as these vexed questions can be finally settled, I will be able to furnish a complete list of the electrical interests in this country from my application files.

"Notification of the intended participation of the foreign electrical people comes under the existing laws, through the commissioners of foreign States. I have up to the present time declined to go actively in the field for foreign exhibits as I believed a general enthusiasm should be created among foreigners by some movement on the part of your administration. Such action has recently been taken, and this department, not the least of any, has experienced the most gratifying result. There are reasons to excuse foreigners from great enthusiasm in regard to the exposition. Electrical expositions are overdone in Europe. The electrical people are under a constant drain in the way of expense for their maintenance. They have grown tired of expositions, therefore. They cite our laws as precluding the advantage which ought to result from an exhibition of their goods. They admit our superiority in electrical work, at least in some directions, and hesitate to compete with us. It will require an effort, therefore, and a subtle presentation of the advantages to accrue from their participation, to induce foreign electricians to make the effort that will be required. This must be a personal effort. Foreigners have many things in electricity which we would do well to know. They are our superiors in artistic features of the work, and their patient methods have brought them to perfection in some directions at which we have not arrived. A spirit of rivalry must therefore be developed in their minds, and when I have completed preliminaries for this work I shall ask that a representative from this department be sent among them.

"I conceive the time to be ripe for holding at the World's Columbian Exposition a great international electrical congress. I have engaged the creation of a sentiment in this behalf since the date of my appointment, and am almost prepared to announce my success. Such a congress will be of world wide interest. It will bring together the most famous men of our time, will create active discussion of issues vital to civilization, and will unquestionably prove of lasting benefit to the exposition and to the new science.

"From this time forward our campaign will be an active one. Electrical conventions of various classes are constantly occurring, and at each of these I will have a representative. Department interest will be shown continuously in the preparation of exhibits in the factories of the electrical companies, and the deference to their wishes will be made a rallying point of enthusiasm. The electrical periodicals are placed at the disposal of the department, and their columns will be constantly employed.

"At the present time I am at work upon special features, including spectacular effects for our exhibit, and shall undoubtedly be able to command for the exhibition new electrical apparatus and new principles that will make a bright epoch of the World's Columbian Exposition of 1893."

A meeting of the stockholders of the Magnetic Iron and Steel Ore Company was held at Blacksburg, S. C., August 28 and 29. An entire reorganization of the company was effected, and plans were perfected for the immediate commencement of work. The plan adopted for the present is to mine high-grade ores for shipment to furnaces, and to convert the low-grade ores into iron and steel at the mines as soon as arrangements can be made for that purpose. The company own 14,000 acres of mineral land in the immediate vicinity of Blacksburg, and limestone and manganese are close at hand.



## MANUFACTURING.

### Iron and Steel.

The Pittsburgh Steel Casting Company of Pittsburgh have just turned out a large Bessemer steel rim which measures 15 feet in diameter. The casting in the rough weighs 24,000 pounds, and is one of the heaviest Bessemer steel castings ever made. The rim is intended for the driving wheel of the engine now being built by the Robinson-Rea Mfg. Company for the new mills which that firm are building for the United States Iron and Tin Plate Mfg. Company, at Demmler, Pa.

The Bessemer steel plant at Ashland, Ky., will be put in operation early next month.

The city of Rochester, N. Y., has been asked to further a proposition to extend the Charlotte Iron Works of that place, so as to include the manufacture of iron pipe, by subscribing \$25,000 and the remitting of local taxes. The proposition has been favorably considered, and it is probable that the project will be carried through.

Warren, Wood & Co. have disposed of their interest in the American-Scotch Iron Company (lessees of the Onondaga Iron Company) to Syracuse, Rochester and New York capitalists, who will purchase the property and make extensive improvements. The furnace, which has been banked for two months, will be put in blast at once. Warren, Wood & Co. will continue as selling agents.

The new Bessemer steel plant recently erected for the Ashland Steel Company, at Ashland, Ky., by the Pittsburgh Iron and Steel Engineering Company of Pittsburgh, has been completed. The plant has a capacity of about 400 tons per day. The plant is jointly owned by the Norton Iron Works of Ashland, Ky., the Belfont Iron Works and the Kelly Nail and Iron Company, both of Ironton, Ohio. It is expected that these three firms will consume about two-thirds of the entire output of the plant, the balance being sold in the open market. The Bessemer pig iron used in the plant will be made by the blast furnaces of the Norton Iron Works and the Belfont Iron Works Company.

The Paige Tube Company of Warren, Ohio, have contracted for a shipment of 750 tons of pipe to go to New Orleans, La.

The St. Louis Steel Foundry Company of St. Louis, Mo., have commenced the manufacture of open-hearth basic steel in their new furnace, which has been erected in their newly rebuilt plant in East St. Louis.

The Mahoning Valley Iron Company of Youngstown, Ohio, who recently leased and put in operation the plant of the Wheatland Iron Company, at Wheatland, Pa., signed the Amalgamated Association scale last week.

The Pittsburgh Iron and Steel Engineering Company, engineers and contractors, Lewis Block, Pittsburgh, Pa., have received a contract from the Shenango Valley Steel Company for the erection of a new Bessemer plant which that concern propose to erect at New Castle, Pa. The equipment will consist of two 7-ton Bessemer converters with three 10-foot cupolas, a two-high 36-inch blooming mill and driven by a pair of 42 x 60 inch engines, duplicates of those recently placed in the new steel plant of the Pennsylvania Steel Company at Sparrows Point, Md. Also two blowing engines 60 x 42 x 60 inches in size; 12 tubular boilers 72 inches in diameter and 18 feet long, and two 5-hole soaking pit furnaces. The new plant will have a capacity of 700 tons of billets per day, and will probably be completed and in operation by July 1, 1892. Of this output of 700 tons per day, 460 tons will be used by the New Castle Wire Nail Company, whose works are located at that place. The balance will be disposed of in the various mills at Greenville, Sharon and New Castle. The Shenango Valley Steel Company were organized some months since, and are composed wholly of New Castle capitalists. The officers of the company are as follows: W. E. Reis, president; J. P. H. Cunningham, vice-president; Geo. E. Berger, secretary and treasurer; and Jno. Stevenson, Jr., general manager. The site for the location of the new plant has not as yet been selected, but will probably be during the present week.

The entire equipment of the Worcester Steel Works, Worcester, Mass., is offered at private sale by the assignees. A complete catalogue of the property has been issued by Winslow L. Horne, 6 Oliver street, Boston, Mass.

The Falls Hollow Staybolt Company of Cuyahoga Falls, Ohio, announce in a recent circular that their trade has so increased that they are now enabled to offer hollow staybolts at a price far below the cost of drilling solid

bolts. They manufacture any size from  $\frac{3}{8}$  to  $1\frac{1}{2}$  inch outside diameter, with inside diameter from 1-32 to 9-16 inch.

No. 1 stack of the Lehigh Valley Company, at Aineyville, Pa., which has been undergoing repairs for some time, was put in blast last week.

Mills A and C of the Catsauqua Mfg. Company, at Catsauqua, Pa., were put on double turn last week, and are working very successfully.

The annual meeting of the stockholders of the Thomas Iron Company was held at Hokenauqua, Pa., last week. The following officers were re-elected for the ensuing year: Benj. G. Clarke, president; Samuel Drake, vice-president; Jno. T. Knight, secretary and treasurer. A Board of Directors was also elected, consisting of the following persons: Benj. G. Clarke, Sam'l Drake, J. T. Knight, Sam'l Thomas, Chas. Stewart, J. W. Fuller and W. W. Marsh.

No. 6 Hokenauqua Furnace, Thomas Iron Company, which is equipped with new Durham iron hot blast stoves, made last week 368 tons of iron, of which 335 tons were 1X. 68 tons 2X, the balance being 2 plain.

### Machinery.

At Wheeling, W. Va., last week, a meeting of those interested in the new Edison Electrical Company was held. Robert Hazlett was elected president and Andrew Mitchell secretary. A Board of Directors was chosen, consisting of prominent citizens and capitalists of Wheeling. The new company propose to engage in commercial lighting, furnishing power for motors, elevators, &c.

The Lloyd Booth Company, founders and machinists, of Youngstown, have secured an order for a special 16-inch mill for rolling down shovel blanks, to be placed in the new plant now being erected by the Wright Shovel Company, at Anderson, Ind. This latter firm are at present removing their shovel works from Fallston, Pa., to Anderson, Ind. The Lloyd Booth Company have also received an order from the Cambridge Iron and Steel Company for a 22-inch cold roll mill. For the Lockhart Iron and Steel Company of Pittsburgh they are building a shear, specially designed for cutting socket iron. The firm are making some improvements at their plant in Youngstown, which consist of an addition to their machine shop and a new pattern house.

The Hanover Foundry and Machine Company have been organized at Hanover, Pa., with a capital of \$40,000, for the purpose of manufacturing engines, threshers and all kinds of mill machinery. A machine shop, 140 x 90, a foundry, 60 x 70, and other buildings will be erected.

The contract for the architectural iron work to be used in the new electric power building at Washington has been secured by the Champion Iron Company of Kenton, Ohio, at their bid of \$53,000.

The Foster Machine Company, now of Springfield, Mass., will remove to Westfield, Mass., where a new factory will be erected and the works operated by water power. The main building will be 150 x 50 feet.

The Vulcan Iron Works, at New Britain, Conn., will erect a new foundry, 278 x 78 feet in size.

Humphrey & Sons are erecting a new machine shop and foundry at Joliet, Ill. The building is 150 x 50 feet, and the entire plant of the company will eventually be replaced with new buildings.

The shops of the Jones & Lamson Machine Company, Springfield, Vt., have been equipped with electric lights throughout, and otherwise prepared for running overtime. This concern has recently brought out a chucking lathe which is described as a 20 x 16 inch machine, from the fact that work 20 inches in diameter can be swung in the chuck, while working the length of the turret slide. The depth of work that can be bored continuously is 16 inches.

The Lang & Goodhue Mfg. Company, Burlington, Vt., hydraulic engineers and machinists, are building new shops as follows: Main shop, 300 x 50 feet; foundry, 100 x 40 feet; pattern room, 150 x 40 feet, situated in the new south section of the city on Park avenue. The new plant will afford double facilities, and will be fitted with new machinery of latest design. In their new location the concern expect to add to the line of machinery heretofore turned out.

The R. D. Nuttall Company, Allegheny, Pa., manufacturers of fine machinery, tools and electrical street-car appliances, have announced a dividend of 3 per cent. out of the earnings of the past three months.

### Hardware.

Forest City Bit and Tool Company, Rockford, Ill., are adding machinery to their plant as rapidly as it can be constructed, and advise us that they are getting into shape to do a large business.

The Wright Shovel Company, Beaver Falls, Pa., are about to remove their plant to Anderson, Ind., and expect to be in full operation at that point about January 1, 1892. The company will increase their facilities, and are putting in a train of rolls to produce their shovel blanks under improved methods. It is probable that in the near future they will manufacture their own shovel handles.

Upton Nut Company, Unionville, Conn., who purchased the business, machinery, &c., of the assigned estate of Welch & Lea, Philadelphia, and who are now marketing the well-known M. J. Coleman Eagle bolt, report a heavy trade in these goods, owing to the fact that the market had become exhausted by stoppage of Welch & Lea and closing up of their estate.

The Bangor Edge Tool Company, Bangor, Maine, are perfecting arrangements whereby oil will be introduced as a fuel to be used in the furnaces of their establishment. The advantages possessed by the system which has been adopted lie in the fact that a clean, even fire may always be obtained, the temperature being varied as desired, it being possible to keep the flame at a welding heat for any definite time, or lower or higher, as the needs demand. It is estimated that the company can do as much work with \$250 worth of oil as \$800 worth of coal. The company have gone to a considerable expense in equipping the factory for this process of heating, but the advantages possessed by it have, it is stated, justified a liberal expenditure in this direction.

J. G. Speirs & Co., Worcester, Mass., are about to enter upon the manufacture of bicycles, and have acquired the tools and machinery formerly used by the Bullard Arms Company. A new building is now under construction, which will be of brick, three stories high, 157 x 45 feet. An ell for boiler and engine, 65 x 35 feet, will also be erected. The company will manufacture a safety machine.

### Miscellaneous.

The National Separating & Mfg. Company of Pittsburgh have been granted a charter, with a capital stock of \$20,000. The directors of the new concern are as follows: James S. Cleveland, Wilson E. Griffith of Pittsburgh; W. J. Kiskaddon, Bellevue; William M. Brown, New Castle; Thomas H. Campbell, Allegheny, Pa.

D. R. Lean, engineer and contractor, of Pittsburgh, Pa., representative for the Dunachie Regenerative Brick Kiln, has contracted with the Kentucky Fire Brick Company, Portsmouth, Ohio, for a set of 10 chamber kilns, completely equipped with Wellman gas producers and iron draft stack, 130 feet high by 7 feet in diameter.

The McCaffrey File Works have completed the plans for a new three-story factory at Philadelphia, Pa.

Among licenses recently issued to incorporate under the laws of Illinois are the following: The Chicago Wringer Mfg. Company; location, Chicago; the manufacture of clothes wringers and similar articles; capital stock, \$60,000; incorporators, James G. Barbour, Henry S. Locke and Gideon S. Thompson. The Columbia Supply Company, at Chicago; to manufacture railway supplies; capital stock, \$300,000; incorporators, C. D. Leach, C. A. Cox and John Francis. The Channon Canvas Roofing Company, at Chicago; to deal in roofing materials; capital stock, \$50,000; incorporators, J. H. Channon, H. S. Channon and E. H. Scott. Illinois Metal Company, at Chicago; to manufacture metal goods; capital stock, \$10,000; incorporators, G. W. Collings, C. W. Greene and G. L. Huson. Joliet Steel Bale Tie Company, at Joliet; to manufacture bale-tie machines and bale ties and other machinery and wire products; capital stock, \$5000; incorporators, Robert Heuston, Curtis B. Brainard and Thomas Stevens. The Phoenix Zinc Mining and Smelting Company, at East St. Louis; to operate lead, zinc and other mines; capital stock, \$1,000,000; incorporators, Gustav Rohyn, F. J. Ruth and A. J. Noertemann. Joliet Pitts Company, at Joliet; to manufacture agricultural implements, engines and boilers; capital stock, \$100,000; incorporators, C. B. Garnsey, J. W. Martin and Augustus F. Knox. Paragon Paper File Company, at East St. Louis; to manufacture paper files; capital stock, \$25,000; incorporators, E. L. Adreon, C. C. Higham and H. A. Wahlert.

Contracts have at last been let for the plant of the Bellaire Stamping Company, to be erected at Harvey, near Chicago. The main building will be 217 x 335 feet, three stories high.

# TRADE REPORT.

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 50 Dearborn street, CHICAGO, September 16, 1891.

The railroads have at last been compelled to engage actively in repair work, and the effect is visible in many quarters. Job foundries have numerous orders for railroad castings, and liberal orders are being placed for other kinds of Iron and Steel. Orders of new rolling stock are not up to expectation, but the situation in this respect is improving. The corn crop is now receiving anxious attention, but every day of pleasant weather improves its prospects, and a week or two will tell the story. Should cold weather hold off for that time a season of great prosperity will then be assured for the entire West, and the railroads will all be safe in anticipating their next year's requirements.

**Pig Iron.**—Local Coke Iron has latterly been more active, and sales of several thousand tons are reported. A great deal of figuring is being done on new business, of which there is more in sight than for some time past. Large orders for Southern Coke Iron are also in prospect, while quite a number of transactions occurred the past week, including a few important orders for future delivery. Lake Superior Charcoal has been sold in limited quantities. Buyers hesitate to pay the prices now asked, and are trying to duplicate purchases made some weeks since. Several round lots are thus hanging over the market and may be closed at any time. A very favorable indication of the condition of the trade is the urgency with which consumers are hurrying deliveries of all kinds of Iron. Shipments are being made faster than contracts stipulated in order to meet the wants of foundrymen. Prices have not advanced, but are very firm at former quotations as follows, f.o.b. Chicago:

Lake Superior Charcoal.....	\$17.25 @ \$18.00
Local Coke Foundry, No. 1.....	16.00 @ 16.50
Local Coke Foundry, No. 2.....	15.00 @ 15.25
Local Coke Foundry, No. 3.....	14.50 @ 15.00
Local Scotch.....	16.00 @ 16.50
Ohio Strong Softeners.....	17.75 @ 18.25
Southern Coke, No. 1.....	15.75 @ 16.25
Southern Coke, No. 2.....	15.00 @ 15.25
Southern Coke, No. 3.....	14.50 @ 15.00
Southern, No. 1, Soft.....	15.00 @ 15.75
Southern, No. 2, Soft.....	14.50 @ 14.75
Southern Gray Forge.....	14.00 @ 14.50
Southern Mottled.....	13.50 @ 14.00
Tennessee Charcoal, No. 1.....	18.00 @ 18.50
Alabama Car Wheel.....	20.50 @ 21.50
Coke Bessemer.....	@
Hocking Valley, No. 1.....	17.00 @ 18.50
Jackson County Silvery.....	17.50 @ 18.00

**Spiegeleisen.**—A little figuring is being done in Spiegel for forward deliveries, but sellers continue former prices.

**Bar Iron.**—The car orders in the market last week were placed with car builders near St. Louis, but others are coming up which will soon be in shape for bids. A great deal of work of this kind is in the air, and is expected soon to take tangible form. Bar Iron manufacturers look forward to a heavy trade in Car Iron, and are maintaining a firm attitude, believing that they will be able to get 1.80¢, Chicago. They quote 1.75¢ @ 1.80¢ now, but will only take a limited amount of business at the lower rate named. It is reported that the Calumet mill has shut down, but the managers state that the rumor is wholly incorrect, and that they are taking orders daily.

**Structural Iron.**—A considerable number of petty contracts are being let, making a good volume of business. There is no change to note in prices, but an advance in angles is expected, as the full effect of the advance in freight has not

yet been felt. Mill lots are quoted at 2.15¢ for Angles, 2.60¢ @ 2.70¢ for Tees, 2.20¢ @ 2.25¢ for Sheared Steel Plates, and 3.20¢ for Beams and Channels, Chicago delivery.

**Plates.**—Mill business has been quite heavy. Part of the West Superior contract was placed through Chicago agents for Pittsburgh mills, but the bulk of it went further East. A great deal of business is in sight in scattered lots. Buyers are not now asking for concessions, being satisfied to get the material they need, as the mills are filled with orders. Store business is large, but not quite up to what it should be at this season. Prices are unchanged, but an early advance is being talked about.

**Sheets.**—Black Sheets are not in great demand at the moment, as large buyers have covered their wants for the present, but Galvanized Iron is very active, with heavy inquiries in the market; one of them covers 10 carloads. The cornice shops are busy just now and consuming a great deal of material. The demand is good in other directions also, trade, in fact, being general in its nature. Prices do not stiffen, however, and it now looks as if an advance would only be made when raw materials go up.

**Merchant Steel.**—Quite a spurt occurred in Crucible Spring Steel, caused by the demand from several railroads. More of it was sold last week than for several months. The price was maintained at 3½¢ @ lb. Trade in Tool Steel has seldom been better than now, and prices range from 6½¢ upward, according to quantity and quality. Good orders have been taken for cheap Steel and more are in sight. Carload lots of machinery, Chicago, are quoted 2½¢ upward; Open Hearth Spring, 2½¢; Tire, 2.30¢ @ 2.40¢.

**Track Supplies.**—Inquiries for Steel Rails are good and sales are improving, orders having come in at a lively rate the past week. The condition of business grows more encouraging. Large orders are not numerous, but the aggregate of small lots is quite satisfactory to manufacturers, who quote \$31.50 @ \$33 on business of this character. Splice Bars are selling at 1.80¢ @ 1.85¢; Spikes are being stiffened up to 2.25¢, Chicago, and some good sales have been made in the Northwest. Track Bolts are in active request at 2.80¢ @ 2.90¢.

**Old Rails and Wheels.**—Old Iron Rails have been sold in limited quantities at \$23, and are now quoted \$23.25. Old Steel Rails are dull and nominally worth \$14 @ \$16. Old Car Wheels are in fair demand, with transactions reported at \$16 @ \$16.25.

**Scrap.**—Some inquiry is noted from outside points, but all the local dealers, except one or two, report trade very dull. We quote as follows, per net ton: No. 1 Railroad Forge, \$19 @ \$19.25; No. 1 Forge, \$18.50; No. 1 Mill, \$14 @ \$14.50; Fish Plates, \$23.75; Car Axles, \$23.50; Light Iron, \$9; Machinery Cast, \$12.50; Stove Plate, \$8.50; Cast Borings, \$8; Wrought Turnings, \$10; Axle Turnings, \$12.50; Mixed Steel, \$11; Coil Steel, \$15; Leaf Steel, \$16; Tires, \$15.50.

**Metals.**—Carload lots of Lake Copper are unchanged at 12½¢, and casting brands 12¢ @ 12½¢; Spelter from 4.85¢ to 4.95¢. Pig Lead values at this center have been very firm at 4.30¢, 4.32½¢ and 4.35¢, according to brand and delivery. Some 1300 tons have sold, principally futures, at 4.35¢, and spot and near-by delivery at 4.32½¢. At the close the market is not so strong, and brokers think that for a round lot 4.30¢ would be accepted.

Edwin S. Jackman, manager of Howe, Brown & Co.'s Western branch house, 228

Lake street, Chicago, has issued a stock list of Howe's Steel for the convenience of the trade. It comprises 16 pages of information useful to consumers of Steel, the greater part being a list of sizes and qualities carried in the firm's warehouse.

## Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, September 16, 1891.

**Pig Iron.**—There have been no large transactions during the week, but there is a steady consumptive order trade which in the aggregate is fairly satisfactory. There has been more canvassing of the market, evidently with the view of purchasing in the near future, and the prominent feature is developed that there is less disposition on the part of furnaces to make any concessions. A party on the market for 3000 tons of Gray Forge claimed that he bought it for less than \$9.75 at the furnace, while on the other hand this price was bid for some lots which were not obtained. This price is, however, the current market rate for delivery any time this year, while the inquiries are mainly for deliveries running three months or more into next year, and for which the furnaces insist upon an advance. There have been further orders placed by several railroads for new cars, and some purchases of Car Wheels, as well as Coke Iron, have been made to cover these contracts; and while the aggregate is not very large, it is enough to materially assist in establishing a sentiment of greater confidence. In fact, the improvement as yet is mainly in sentiment, but that must be the forerunner of any substantial increase in business; and this is certainly a gain over the depression which has recently existed that is decidedly encouraging. The money market has become decidedly easier, and collections as a rule are satisfactory and are apparently growing better. Quotations are unchanged:

### Foundry.

Southern Coke, No. 1.....	\$14.75 @ \$15.00
Southern Coke, No. 2.....	13.50 @ 13.75
Southern Coke, No. 3.....	13.00 @ 13.25
Ohio Soft Stone Coal, No. 1.....	16.50 @ 17.00
Ohio Soft Stone Coal, No. 2.....	15.50 @ 16.50
Mahoning and Shenango Valley.....	17.00 @ 17.50
Hanging Rock Charcoal, No. 1.....	20.00 @ 21.00
Hanging Rock Charcoal, No. 2.....	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1.....	16.00 @ 17.00
Tennessee and Alabama Charcoal, No. 2.....	15.00 @ 16.00

### Forge.

Gray Forge.....	12.50 @ 12.75
Mottled Neutral Coke.....	12.00 @ 12.25

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel.....	19.25 @ 19.75
Hanging Rock, Cold Blast.....	25.00 @ 26.00
Lake Superior Car Wheel and Malleable.....	18.00 @ 18.50

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., September 15, 1891.

There is little or no change in prices, but there is an undertone of strength which is very significant. As remarked in a recent report, sellers are not troubling very much about prices, as they are confident that they will adjust themselves shortly. The main consideration for the present is to secure plenty of business and to get everything into good working order. This is being accomplished in a quiet, unobtrusive way, and it is believed that the volume of business will soon be large enough to lead to a material advance in prices. Another strong feature is the unwillingness to accept orders for deferred delivery. Almost anything can be had at quoted rates for this or next month's delivery, but for later dates there is a good deal of hesitation, especially when the lots are large. It is therefore tolerably safe to say that prices are on the verge of an advance. It may not be immediately, and it may not be of any important



amount, but it is universally recognized that the course of the market for some time to come will be in the direction of higher figures.

**Pig Iron.**—Notwithstanding the very large output, consumption appears to be fully in line with the supply, so that there is a perceptible stiffening in quotations for good Irons. There is a better demand for all grades, in fact, but especially for foundry purposes. Prices are a shade dearer, but not quotably so, although there is a gradual breaking away from the inside figure, while transactions at top figures are increasingly frequent. The position appears to be entirely in sellers' favor, and a gradual appreciation in values appears to be almost inevitable. The very large output acts as a safety valve, however, so that there is no immediate probability of any such extraordinary movements as have been seen in former times, although even these are not entirely beyond the bounds of possibility. The position in Europe is so complicated that no one can foretell what a day may bring forth, and in the event of a great war this country may have extraordinary demands made upon it. This, of course, is merely a contingency, and one that in the interests of humanity would be greatly deplored. As yet the only precaution which sellers feel called upon to make is to curtail their engagements to reasonably early deliveries. There is no difficulty in buying moderate quantities covering the balance of the year, while a few may go three months further; but the general disposition is to keep within 60 or 90 days. On such conditions sales have been made at about the following quotations, varying according to brand, point of delivery, date for delivery, &c.:

Ohio Softeners, No. 1x.....	\$19.00 @	.....
Ohio Softeners, No. 2x.....	18.00 @	.....
Standard Penna, No. 1x.....	17.75 @	\$18.00
Standard Penna, No. 2x.....	16.25 @	16.75
Medium Penna, No. 1x.....	17.25 @	17.50
Medium Penna, No. 2x.....	16.00 @	16.25
Virginia, No. 1x.....	16.50 @	17.25
Virginia, No. 2x.....	15.50 @	16.00
Standard Neutral All-Ore Forge	14.25 @	14.75
Ordinary Forge Cinder mixed ..	13.75 @	14.00
Hot-Blast Charcoal.....	20.00 @	22.00
Cold-Blast Charcoal.....	24.00 @	27.00

**Bessemer Pig.**—There are intimations of several large transactions in this grade of Iron, but it is difficult to secure particulars, although \$16.50 @ \$17, at furnace, for standard brands is mentioned, and \$18.50 @ \$19 for specials.

**Ferromanganese.**—Holders ask \$64.50 for 80 %, duty paid, with buyers at about \$1 less.

**Steel Rails.**—The demand is improving, but no large transactions have been reported. Small and medium sized lots are taken at \$30, and there is said to be considerable inquiry for options at that figure for spring delivery, which, however, are not always granted, although manufacturers are open for a liberal business at current quotations for the winter months.

**Steel Slabs and Billets.**—A good deal of business is understood to have been closed recently at prices equivalent to about \$27 Harrisburg, or \$27.50 Philadelphia. Orders could still be placed at these figures, and possibly a little less for immediate delivery, but on long options more money would be asked. There is considerable business pending, but at figures named makers seem to be pretty firm.

**Muck Bars.**—The market is extremely dull, and it is almost impossible to secure bids on terms that holders could accept. Asking prices are from \$26.50 to \$27, delivered, bids hard to get at anything over \$26 @ \$26.25.

**Bar Iron.**—There is a pretty good general demand, but large orders are still conspicuously absent. Mills are moderately full of work for two or three weeks to come, but most of them would like to take on about double that quantity, and

in the effort to secure it prices have had no chance for improvement. This condition of affairs is not likely to continue much longer, however, but until the orders are actually secured it is doubtful if any one will feel strong enough to advance their prices. Meanwhile current quotations are from 1.70¢ to 1.75¢ for city deliveries, or 1.65¢ to 1.70¢ at interior points.

**Skelp Iron.**—There is no general demand at present, although one mill is said to have placed several thousand tons recently. Nominal quotations for Grooved are from 1.70¢ to 1.72½¢, delivered.

**Plates.**—The demand is moderately active, and several leading concerns have been trying for about ½¢ advance. The result has not been satisfactory so far, as most of the orders have gone elsewhere, showing that somebody has been willing to sell at the old prices, and, in fact, lower quotations than ever have been named for Steel. We refrain from stating the exact figures, because we have no means of knowing what the quality was, although it was claimed to be fully up to standard. The usual asking prices are about as follows, delivered, but as already stated they have not been very closely adhered to in some recent transactions:

	Iron.	Steel.
Tank Plates.....	1.90 @ 2.00¢	2.00 @ 2.10¢
Refined.....	2.20 @ 2.30¢	2.10 @ 2.20¢
Shell.....	2.30 @ 2.40¢	2.40 @ 2.50¢
Flange.....	3.30 @ 3.30¢	2.50 @ 2.75¢
Fire-Box.....	4.00 @ 4.25¢	3.00 @ 3.50¢

**Structural Material.**—Mills are doing fairly, but there is no urgency in the demand, and nothing to indicate any immediate change from conditions recently ruling. Bridge and ship work is moderately active, and some business is expected from the Reading Terminal, but as we said before, there is no crowding of orders at present. Prices are unchanged, and are quoted as follows, delivered: Angles, 2.05¢ @ 2.10¢; Sheared Plates, 2¢ @ 2.10¢, and 10¢ @ 15¢ more for Steel, according to requirements. Tees, 2.5¢ @ 2.6¢; Beams and Channels, 3.1¢ for either Iron or Steel.

**Sheet Iron.**—Mills are quite busy, and the demand is increasing. Prospects are considered very encouraging, and although there is no quotable change in prices, there are no such concessions as were made a little while back. Best makes quoted as follows:

Best Refined, Nos. 14 to 20.....	3.00¢ @ 3.10¢
Best Refined, Nos. 21 to 24.....	3.10¢ @ .....
Best Refined, Nos. 25 to 26.....	3.20¢ @ 3.30¢
Best Refined, No. 27.....	3.40¢ @ .....
Best Refined, No. 28.....	3.50¢ @ .....

Common, ½¢ less than the above.  
Best Soft Steel, Nos. 14 to 20.....3¢ @ 3¼¢  
Best Soft Steel, Nos. 21 to 24.....3¼¢ @ .....

Best Soft Steel, Nos. 25 to 26.....4¢ @ .....

Best Soft Steel, Nos. 27 to 28.....4¢ @ .....

Best Bloom Sheets, ½¢ extra over the above prices.

Best Bloom, Galvanized, discount.... @ 67½ %

Common, discount..... @ 70 %

**Old Material.**—There is no particular change to note in this department. Demand is a shade better, but there is plenty of stuff for sale, so that buyers can supply themselves at about the figures recently ruling, viz.: Iron Rails, \$21.50 @ \$22.50; Steel Rails, \$17 @ \$18, delivered. No. 1 Railroad Scrap, \$20 @ \$21, Philadelphia, or for deliveries at mills in the interior \$21 @ \$21.50, according to distance and quality; \$15 @ \$16 for No. 2 Light; \$14 @ \$15 for best Machinery Scrap; \$13 @ \$14 for ordinary; \$14.50 @ \$15.50 for Wrought Turnings; \$9 @ \$10 for Cast Borings, and nominally \$24 @ \$25 for Old Fish Plates, and \$16 @ \$17, delivered, for Old Car Wheels.

**Wrought-Iron Pipe.**—There is more doing, but prices are not maintained with much uniformity. Discounts are nominally as follows:

Butt-Welded Black.....	62½ %
Butt-Welded Galvanized.....	42½ %
Lap-Welded Black.....	62½ %

Lap-Welded Galvanized.....	50 %
Boiler Tubes, 2½ inch and under.....	52½ %
Boiler Tubes, 3 to 6 inch.....	60 %
Boiler Tubes, 7 inch and larger.....	55 %

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, September 15, 1891.

**Pig Iron.**—We have to report a more active and firmer market, and some sales have been made for future delivery at an advance. Furnacemen are still willing to sell in a small way for immediate delivery at unchanged prices, but when it comes to specified deliveries in the later months of the year an advance is demanded, and will, no doubt, be obtained. Prices may be fairly quoted as follows, for immediate or near-by delivery.

Neutral Gray Forge.....	\$13.75 @ \$14.00, cash.
All-Ore Mill.....	14.50 @ 15.00, "
White and Mottled.....	13.00 @ 13.50, "
No. 1 Foundry.....	16.25 @ 16.50, "
No. 2 Foundry.....	15.25 @ 15.50, "
No. 3 Foundry.....	14.75 @ 15.00, "
No. 2 Charcoal Foundry.....	20.50 @ 21.00, "
Cold-Blast Charcoal.....	25.00 @ 27.00, "
Bessemer Iron.....	15.50 @ 15.75, "

It may be noted that while we do not quote Bessemer Iron above \$15.75, sales have been made for late delivery at \$16, cash, and some furnacemen are not anxious to contract for November and December at this price. Production appears to be about at a stand, while consumption is increasing, and it may be counted a certainty that there will be a big consumption from now on until the close of the present year.

**Muck Bar.**—There is an increasing demand, and we have to report a more active and firmer market; while no sales have been reported the past week above \$26.50, cash, some sellers are refusing to accept less than \$26.75. There are buyers for pretty good sized lots at this price.

**Manufactured Iron.**—The activity noted in our report of last week continues, and manufacturers not only here but in the Wheeling, Shenango and Mahoning Valley districts are all well sold up, and it is difficult to have an order of any magnitude placed for immediate or even near-by delivery. It is said that nearly all the mills are sold from three to six weeks ahead of their production, and while there has been no general advance as yet, prices are much firmer and very few manufacturers are willing to book orders for future delivery at current rates; they are willing to take orders with the understanding that they are to get market price at the time of delivery, whatever that may be. Mills out in the Mahoning and Shenango Valleys are getting an advance of from 50¢ to \$1 per ton as compared with the low prices they sold at some months ago. We quote city-made Iron at 1.70¢ @ 1.75¢ for Bars; 2.05¢ @ 2.10¢ for Plate and Tank, and No. 24 Sheet at 2.75¢, all 60 days, 2 % off for cash. Skelp Iron is higher; we now quote Grooved 1.70¢ @ 1.75¢ and Sheared at 1.90¢ @ 2¢, four months, 2 % off for cash.

**Structural Material.**—The activity noted in our last report continues, and manufacturers are very busy. Prices firm, but unchanged. Channels and Beams, 3.10¢; Sheared Steel Bridge Plates, 2.15¢ @ 2.20¢; Angles, 2¢; Tees, 2.60¢; Universal Mill Plates, Iron, 2.05¢; Refined Bars, 1.80¢ @ 1.85¢.

**Steel Plates.**—Dullness still obtains in this line. Manufacturers do not appear to be able to give any particular reason for the dullness which has prevailed for some considerable time past, but it obtains all the same. We repeat former quotations: Fire Box, 3.90¢ @ 4.25¢; Tank, 2.10¢; Shell, 2.35¢; Flange, 2.55¢.

**Merchant Steel.**—There is an increasing demand, but prices remain un-

changed as follows: Crucible Tool Steel, 6½¢ @ 7¢; do. Spring, 4¢; do. Machinery, 4½¢ @ 5¢; Bessemer Machinery, 2.40¢ @ 2.50¢; do. Toe Calk, 2.50¢; Tire Steel, 2.20¢; Steel Bars, 1.80¢ @ 1.85¢. It may be noted that there is an increasing demand for Steel Bars, which for some purposes are supplanting Iron, the difference in the cost being small.

**Barb Wire.**—Only a moderate trade, which is attributed in some degree to the advancing of prices by the syndicate, and there appears to be a disposition on the part of jobbers to hold back in order to ascertain whether or not present prices are likely to be maintained. We continue to quote Painted in car lots at \$2.75; less than a carload, \$2.80; Galvanized, \$3.25 in car lots and \$3.30 for less.

**Nails.**—There does not appear to be much inquiry for Cut Nails, but owing to a very light production prices are firm, and a more active demand is not improbable as the season becomes more advanced. We continue to quote 30¢ to 35¢ average at \$1.55 @ \$1.60, 60 days, 2 % off for cash, f.o.b. at factory. In regard to Wire Nails, while some sales have been made recently for near-by delivery at \$1.85; there are but few, if any, sellers now under \$1.90, 60 days, 2 % off. Contracts cannot be made for future delivery below the price last quoted, while it is possible they might still be bought for immediate delivery at \$1.85.

**Wrought-Iron Pipe.**—The regular monthly meeting of the Manufacturers' Association took place in New York last Thursday, but there was nothing done excepting to reaffirm former prices. There is an improved demand reported, especially for small pipe, which it is expected will be still more improved as the season advances. We continue to quote discounts as before: On Black Butt Pipe, 52½ %; on Galvanized do., 42½ %; on Black Lap, 62½ %; on Galvanized do., 60 %; Boiler Tubes, up to 2½-inch inclusive, 55 %; 3 to 6 inch inclusive, 60 %; 7-inch and larger, 55 %; Casing, all sizes, 55 %.

**Wire Rods.**—Reports were sent out from here some weeks ago of sales at \$33 @ \$33.50 and \$34, cash, which it is now believed were never made. It is probable the object in making these bogus reports was to bear the market. One of our manufacturers reports a sale during the week of a lot of 1000 tons at \$35.50, cash, at mill.

**Billets and Slabs.**—There is considerable inquiry, and while prices remain unchanged at \$25, f.o.b. at makers' mill, for immediate delivery, later deliveries are held 25¢ to 50¢ per ton higher. There has been a very large business within the past few weeks, and it is very evident that the mills are well sold up.

**Ferromanganese.**—We are advised of regular sales, mostly in small lots for immediate or near by deliveries, of 80 % domestic at \$66.50, cash. Foreign cannot be sold in this market in competition with domestic.

**Old Rails.**—There is still considerable inquiry for Old Iron Rails, with but little offering; may be quoted at \$23.50 @ \$24. Old Steel Rails continue quiet, and prices may be quoted in the absence of sales at \$17 @ \$18 for short and long pieces.

**Railway Track Supplies.**—The activity noted for some time past continues, and the mills making a specialty of the same have all they can do to keep up with their orders. Spikes 2.15¢ @ 2.20¢, 80 days, f.o.b. at makers' mill; Splice Bars, 1.75¢ @ 1.80¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

**Steel Rails.**—There is an increasing demand, orders for over 20,000 tons having been placed here recently, and the price is firm at \$30, f.o.b. at mill.

**Old Material.**—There is a fair and increasing demand, but prices remain about as last quoted. Sales No. 1 Railroad Wrought Scrap at \$19.50 @ \$20, net ton; Cast Scrap, \$13.50; Steel Rail and Bloom Ends, \$17 @ \$17.50.

**Coke.**—There is a steady demand at unchanged prices.

(By Telegraph.)

The Moorhead-McCleane Company have issued a statement showing the financial condition at the close of business September 1. This statement shows their assets, which include cash on hand, bills receivable, real estate, blast furnace property, rolling stock, mill buildings and machinery, galvanizing works, open-hearth steel plant, &c., amounting to \$2,685,923.57, while their total liabilities, including a mortgage of \$400,000 against the plant, amount to \$1,314,469.45. These figures show that their assets are \$1,371,454.12 in excess of their liabilities. The above statement will be sent out to the creditors to-day, and a meeting of creditors will probably be called to take place in a few days. Geo. F. McCleane, who has been general manager of the plant for a number of years, has resigned his position on account of ill health and will be succeeded by Jno. H. Miller, formerly manager of the galvanizing department. The plant continues in full operation, and it is not expected that a shut-down will occur on account of the favorable showing made by the firm. It is thought they will not experience any trouble in securing an extension.

The Totten & Hogg Iron and Steel Foundry Company of Pittsburgh, have just received an order for a carload of rolls for the Pacific Iron and Nail Company of San Francisco. This is the second order of this kind received from that company within a month. They are also in receipt of an order from the Canonsburg Iron and Steel Company of Canonsburg, Pa., for two large gear wheels weighing about 25 tons.

A. A. Keating, for a number of years treasurer of Zug & Co., Limited, proprietors of the Sable Iron and Nail Works of Pittsburgh, has resigned his position.

## Cleveland.

CLEVELAND, September 14, 1891.

**Iron Ore.**—During the past seven days the receipts of new Ore at Cleveland aggregated 72,000 tons, as compared with 47,000 tons for the same week last year. The total receipts at all lower lake ports for the week just closed have exceeded 300,000 tons, a gain of 50,000 tons over the amount sent down in the corresponding seven days in 1891. The shipments to the furnaces have correspondingly increased, 40,000 tons of new Ore having been sent along from Cleveland, against 28,000 tons for the same week last year. The furnacemen are buying new Ore very sparingly, the increased quotations being entirely out of harmony with the apathy just now existing in the Pig-Iron market. It is quite probable that no very large amounts of ore will be sold this season. Many of the furnacemen are well supplied and those that are not will be able to get along with very slight additions to their stock on hand. The amount of new Ore already purchased is considerably larger than the

early season estimates of the entire season's output. This amount, together with the unsold Ore on the docks at the opening of navigation, will come very near supplying the demands of the Ore consumers until new Ore begins coming down next year. Lake freights are back to the high notch again, \$1 being demanded from Escanaba, \$1.15 from Marquette and \$1.25 from Ashland and Two Harbors. The few and wholly unimportant sales reported for the past week have been on the basis of a 50¢ advance over June and July quotations.

**Pig Iron.**—Prices are unchanged, but the market is a little firmer. The demand is certainly better, and, although quotations are approximately the same as a week ago, there has been a slight increase in sales. Dealers have the utmost faith in an early improvement in prices, and insist that every condition of the market is encouraging. There are no noteworthy features of the market this week. Sales have been few and the amounts involved insignificant. Strictly local quotations are as follows:

Nos. 1 to 6 Lake Superior Charcoal	\$13.50 @ \$19.00
Nos. 1, 2 and 3 Bessemer, per ton	16.00 @ 16.25
No. 1 Strong Foundry, per ton	16.25 @ 16.75
No. 2 Strong Foundry, per ton	15.25 @ 15.75
No. 1 American Scotch, per ton	16.80 @ 17.00
No. 2 American Scotch, per ton	15.80 @ 16.85
No. 1 Soft silvery, per ton	16.50 @ 17.50
Mahoning and Shenango Valley Neutral Mill Irons, per ton	14.00 @ 14.50
Mahoning and Shenango Valley Red Short Mills, per ton	14.00 @ 14.50

**Nails.**—The market is quiet. Steel Wire Nails are reduced from \$2.05 to \$2 in stock, Steel Cut Nails remaining at \$1.70.

**Manufactured Iron.**—The demand is still remarkably brisk, and the mills are overcrowded with orders. All kinds of Sheet Iron are eagerly asked for at slightly advanced prices. Structural Iron is in good favor. Common Bar is in big demand at from the mills 1.70¢.

**Old Rails.**—Not much is being done. Old Americans are quoted at \$22.50 @ \$23, but only small and scattering sales are reported.

**Scrap.**—There has been some improvement in the market, although prices are still fixed on the basis of \$19.25 @ \$19.50 for No. 1 Railroad Wrought.

## St. Louis.

(By Telegraph.)

The demand for Pig Lead shows some improvement. A sale of 100 tons was made to-day, spot delivery, at 4.30¢. The market is firm at this figure, and offerings which were made last week at 4.25¢ have been withdrawn. Spelter is offered in limited quantities on the basis of 4.70¢, which is now considered bottom. The market is not as heavy as one week since, and holders do not appear so urgent to sell, and on the whole the outlook is brighter.

## Detroit.

WILLIAM F. JARVIS & Co., Detroit, Mich., under date September 14, say: While there has been no material change in the market during the week under review, yet there have been a number of transactions in Lake Superior Charcoal. While the amount in any single transaction has not been very large, yet in the aggregate the tonnage has been very satisfactory, and in no case has the seller been forced to make a concession. The uncertainty of freights remaining as at present is causing sellers to hesitate to contract for future delivery at present figures, and



the buyers are not yet ready to stand an advance, and are waiting in hopes that concessions will be offered. Some few orders for Coke Irons are being placed, and occasionally one for Bessemer. The inquiry for prompt shipment is increasing, and the outlook for larger business is very good. With demand moderate and prices firm, we quote as follows:

Lake Superior Charcoal, all numbers	\$18.00 @ \$18.50
Lake Superior Coke, Bessemer	17.75 @ 18.50
Ohio Blackband (40 per cent.)	18.00 @ 18.50
Lake Superior Coke Foundry, all ore	17.50 @ 18.00
Southern No. 1	16.25 @ 16.50
Southern Gray Forge	14.00 @ 14.50
Jackson County (Ohio) Silvery	18.00 @ 18.50

## New York.

Office of *The Iron Age*, 96-102 Reade street, New York, September 16, 1891.

**American Pig.**—Reports from Southern producers indicate that prices, notably for the lower grades, still remain at low figures. B. G. Clarke of the Thomas Iron Company reports a sale of 10,000 tons of Gray Forge Iron at a price equivalent to \$15, tidewater. Northern brands are quoted at \$16.75 @ \$18 for No. 1; \$16 @ \$16.50 for No. 2, and \$14 @ \$14.50 for Gray Forge. Southern Irons sell at \$16 @ \$17 for No. 1; \$15.25 @ \$16 for No. 2; \$15.50 @ \$16 for No. 1 Soft, and \$14 @ \$14.50 for Gray Forge.

**Spiegeleisen and Ferromanganese.**—After a long spell of dullness a large transaction has again taken place in Spiegeleisen, an Eastern steel works having bought 4000 tons of English 30 % Spiegeleisen, for delivery 1000 tons monthly, beginning with October shipment. The competition was lively and the price is reported to have been low. We quote \$27.50 @ \$28.50. In Ferromanganese no business is reported. The reports of irregularity in the transaction referred to in our last led to a meeting of the English Ferromanganese makers in London on Monday. The details of the proceedings are not known, but agents on this side have received instructions to adhere to the combination price of \$64.50, tidewater. Importers claim that the sales of Domestic Ferro in the Pittsburgh district are made at \$66.50, whereas the combination price of \$64.50 plus \$2.40, freight from Baltimore to Pittsburgh, would make it \$66.90.

**Billets and Rods.**—The market is very quiet in both Billets and Rods, although an advance to \$35 is reported in the latter from Pittsburgh. There has been some business in Foreign Rods for Canada, some round blocks having been placed. Foreign Rod makers quote £6, f.o.b. shipping port. It appears that a considerable number of mills have been turned over to other shapes, so that the supply is moderate.

**Swedish Stock.**—Rivet Rods are now held at \$58.50 @ \$59, and \$66 has been offered for Bars.

**Manufactured Iron and Steel.**—Merchants report a lull in new business closed, but have a number of negotiations in hand which will be closed at an early date. We continue to quote: Angles, 1.90¢ @ 2.10¢; Sheared Plates, 1.95¢ @ 2.25¢; Tees, 2.45¢ @ 2.75¢, and Beams and Channels, 3.1¢, on dock. Steel Plates are 1.95¢ @ 2.15¢ for Tank; 2.25¢ @ 2.6¢ for Shell; 2.4¢ @ 2.6¢ for Flange, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2.15¢ @ 2.20¢, delivered. Steel Axles 2.15¢ @ 2.25¢, and Links and Pins, 2.15¢ @ 2.20¢.

**Steel Rails.**—More interest is shown in the market by buyers, but the trans-

actions are still confined to small lots. According to the report of the association the orders of the mills aggregated on September 1 894,798 gross tons, standard sections, as compared with 860,755 gross tons on August 1. The deliveries have been 699,027 tons up to September 1, against 584,938 on August 1 and 451,423 tons on July 1. The mills, therefore, have only two months' work on hand, even at the slow rate at which they have been running lately. At the meeting last week a committee of two, representing the Eastern and the Western mills, was appointed to consider and report upon the question of the allotment of percentages, which must undergo a modification since the starting of the new works. The present percentages are 9 % to the Pennsylvania, 18 % to the Lackawanna, 8 % each to the Bethlehem and the Cambria, and 57 % jointly to Carnegie and Illinois. We continue to quote \$30 75 @ \$31 at tidewater. Advances from Harrisburg just received, report that H. C. Frick has been delayed by an accident, and that the meeting of the committee of the Rail makers cannot, therefore, be held to-day.

**Track Material.**—Some of the mills report having sold heavily of Spikes, and are quoting 2.25¢, delivered. Some good orders have been taken for Fish Plates, which we quote 1.75¢ @ 1.80¢, delivered. Bolts are 2.80¢ @ 3¢ for Square and Hexagon.

**Merchant Steel.**—Western manufacturers have made some very low prices in Eastern territory lately. We quote Hot-Rolled Shaffing 2.05¢ @ 2.10¢; Machinery, 2.15¢ @ 2.25¢; Tire, 2.20¢ @ 2.25¢, and Toe Calk, 2.25¢ @ 2.30¢, delivered.

**Old Material.**—There has been more activity, and consumers are taking more interest, although some of the mills which at one time were large purchasers of Old Iron Rails have ceased using them entirely. We note a sale of 300 tons of Old Iron Rails at \$21, Jersey City, with negotiations pending for a large block of American. Old Steel Rails have sold to the extent of 1000 tons at prices equivalent to \$16.50 @ \$17 here. A lot of 400 tons of Steel Street Rails is being offered for sale.

E. Van Hoegaerden & Co., Anvers, quote the following c.i.f. New York prices for Beams and Channels of different sizes and weights, per ton of 1015 kg. in 10-ton lots:

Beams.		£.	s.	d.
Class 1	.....	6	0	0
Class 2	.....	6	2	6
Class 3	.....	6	5	0
Class 4	.....	6	7	6
Class 5	.....	6	15	0
Class 6	.....	7	5	0
Class 1	.....	6	7	6
Class 2	.....	6	10	0
Class 3	.....	6	12	6
Class 4	.....	6	15	0
Class 5	.....	6	17	6
Class 6	.....	7	0	0
Class 7	.....	7	2	6
Class 8	.....	7	5	0

Channels.		£.	s.	d.
Class 1	.....	6	7	6
Class 2	.....	6	12	6
Class 3	.....	6	17	6

The lowest price named would be equivalent to about 2.30¢. They claim that many of the sections are the exact American.

A. T. Shoemaker, long known in this city through his connection with the Troy Steel and Iron Company, and the Illinois Steel Company, has established himself at 146 Broadway, and Rookery Building, Chicago. Mr. Shoemaker will make a specialty of Railroad Supplies and Equipment.

## Financial.

The most important announcement of the week bearing on the general situation was that emanating from the Government in regard to the condition of the crops on the 1st of the month. The following are the figures relating to the grain crops as compared with the two preceding months:

	July 1.	Aug. 1.	Sept. 1.
Corn	92.8	90.8	91.1
Spring wheat	94.1	95.5	96.8
Oats	89.5	89.5	95.1
Spring rye	86.2	89.6	95.1

This is the best exhibit of September condition made for many years, and in respect to corn it is especially gratifying. Another week of what is regarded as the most critical period for the corn crop has passed without any reports of serious injury. In other years it would be safe now, but then the season is from a week to ten days late in the northern portion of the corn belt, and a killing frost may yet do considerable damage. If it does not come during this week, and the telegraphic reports of night temperatures do not indicate it, then all the leading grains will be safely harvested. It only needs, then, a little patience until the realization of the high hopes formed on the strength of the exceptionally favorable conditions for general and widespread prosperity.

Speculation in Wall street has come to a halt, which for some days approached the condition of a deadlock. The adjustment of the difficulties in Union Pacific finances dragged somewhat. Disquieting rumors that some of the creditors were impatient and threatened to market collateral had their effect. It is understood that the concerns to whom money was due for supplies furnished, notably the car companies, have been settled with. Still a feeling of nervousness has remained now that it is thoroughly understood how dangerous was the condition of the company. On the top of it came the alarming reports concerning the Richmond Terminal Company, which has only been propped up by similar means, a number of capitalists backing it. The method adopted for the temporary relief of corporations by the acceptance of long notes, at a heavy discount, and bearing 6 % interest, with large blocks of unsalable securities as collateral, is well enough for the time being. It adds serious burdens to the concerns themselves and depends for success upon the gradual marketing of securities to which the taint of previous practical failure attaches. As yet the general investing public has taken very little hold of the stock market, although bonds have been purchased to a fairly liberal extent. It may well be questioned whether the happenings of the past few weeks, emphasizing as they do the teachings of years, will not strengthen the conviction of many investors that funds may be more profitably and more safely placed in other undertakings than railroads. It seems probable that good industrial stocks will become favorites, that large sums will go into municipal improvements, notably into the conversion of horse-car into electric roads, into electric lighting, fuel-gas plants, &c.

The weekly statement of the Associated banks showed a decrease in the amount of reserve held above the 25 per cent. legal requirements of \$433,625, largely owing to an increase of \$1,116,900 in deposits. Loans expanded \$935,400. Specie increased \$2,945,300, and legal tenders decreased \$3,099,700. Circulation increased \$67,600.

During the week the arrival of gold amounted to \$1,500,000 and \$1,150,000 more has been engaged for shipment to this country. The exchange market has reached a point where gold imports are profitable, but it has become evident that the Bank of England is making efforts to

resist the movement. An order for \$500,000 was canceled on account of the high price for bars asked by the bank.

When asked if he expected any stringency in the money market this year, Secretary Foster of the Treasury Department said yesterday: "I certainly do not. The money market will, I think, be easy during all the fall months. In addition to the \$25,000,000 paid out by the Treasury Department for the retirement of the 4½'s, it should be borne in mind that gold is coming this way, and the receipts in this direction will undoubtedly be large. I do not think that the return of gold will be equal to the exports, but I nevertheless look for a considerable return movement."

The quotations for U. S. bonds were as follows:

	Bid.	Asked.
U. S. 4½ % 1891.....		
U. S. 4½ % coupons.....		
U. S. 4 % registered, 1907.....	117	117½
U. S. 4 % registered, 1907, stamped.....		
U. S. 4 % coupons, 1907.....	118	118¾
U. S. 4 % coupons, 1907, stamped.....		
U. S. currency 6's.....	116	

The following are the quotations for foreign exchange:

	60 days sight.	Demand.
Prime Sterling Nominal 482 @.....	484½ @.....	
" Selling 482 less ¼ @.....	484½ less ¼ @.....	
Com'l on Bankers.....	481 @ 481½	483¼ @.....
Docum'ts for pay.....		
ment.....	480 @.....	482¾ @.....
Francs (Paris).....	523¾ less ¼ @.....	521¼ less ¼ @.....
Com'l do.....	520¼ @.....	523¾ @.....
Francs (Antwerp).....	523¾ less ¼ @.....	521¼ less ¼ @.....
Com'l do.....	520¼ @.....	523¾ @.....
Reichsmark.....	94¾ @.....	95¾ @.....
Com'l do.....	94¾ @.....	94¾ @.....
Guilders (Holland).....	40¾ @.....	40¾ @.....
Com'l do.....	39¾ @.....	39 13-16 @.....

The actual standing rates for 60 days are \$4.81½ and the demand \$4.84 and \$4.84½.

## Metal Market.

**Pig Tin.**—In the speculative way there has been no movement of striking interest during the past week. Importations have been heavy, and London has sent mean consolation in the shape of slightly lower range of value there. Local holders of the bulk of spot stock seem still to successfully resist the pressure of rather adverse conditions, however, and the efforts of the "bear" interest, besides being feeble, are suggestive of fear that the enemy is too well entrenched to be dislodged with the force now at command. Meanwhile, a very fair consumptive outlet has been found for stock at prices close to those established on net cash trades, and 5¢ @ 7½¢ @ lb is to go upon record as the full extent of the week's decline in value. On the Metal Exchange 10-ton lots were sold at 20¢, net cash, for current month, and 20.05¢ for November delivery. Ordinary jobbing parcels went at 20.15¢ @ 20¼¢, out of store. Straits shipments during first half of September were advised as being only 875 tons, against 1475 tons during first half of August.

**Copper.**—The situation in the market for this metal is practically the same as it was a week ago. The home consumption has improved somewhat under the influence of recent sharp cuts in prices for several lines of manufactured goods, and export movement on old contracts is still on a liberal scale, but production is doubtless more than sufficient to meet current demands, and prices merely hold their own. Lake Superior Ingot has been sold to the extent of several hundred thousand pounds at 12½¢, cash, for prompt delivery, and that price apparently represents inside value at this writing. Future deliveries are held firmly at 12½¢. Bids of 1¼¢ less were refused. In Arizona there is hardly enough doing to fairly determine market value. The range of 12¢ @ 12½¢, as to delivery, is quoted. Casting Copper

is selling to a fair extent, chiefly in moderate-sized parcels, at 11¼¢ @ 11½¢, as to brand.

**Pig Lead.**—On Saturday last there were some alleged transactions of a peculiar character, through which it was endeavored to create the impression that the price of Lead not only receded to 4.45¢, but went as low as 4.40¢. *Bona fide* trades in the regular way were made at 4½¢ on the succeeding business days, however, and nearly, if not quite, 1000 tons changed hands within 48 hours at that rate. The peculiar deals referred to may doubtless be explained in certain quarters, but that actual market value has not been below 4½¢ during the week under review is a fact. Consumers are buying cautiously, but the record of transactions since the 1st inst. indicates that purchases have been fully up to the average for the season.

**Spelter.**—Late extensive purchases of Western brands at 4.90¢ seem to have satisfied consumers' wants in a great measure, but they also removed cheap lots in a good measure, and 4.95¢ @ 5¢ are close prices for the present. The demand is fair, but chiefly for single carloads.

**Antimony.**—Outside of the routine jobbing trade there has been little doing, and prices are without decided change. Hallett's is quoted at 10¢, LX at 10½¢, L. J. & C. at 11¢ and Cookson's at 12¼¢, in wholesale quantities.

**Tin Plate.**—No distinctively new features have appeared during the past week. Offering of Coke Finish Plates is still free enough to keep prices rather weak in that line, but Charcoals and Ternes remain in very fair shape, and prices for those varieties are still quite firm. We quote: Coke Tins—Penlan grade, IC, 14 x 20, \$5.35; J. B. grade, do., \$5.45; Bessemer do., \$5.40; Siemens Steel, \$5.50; Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.75; Siemens Steel, IC basis, \$5.85 @ \$6; IX basis, \$6.85 @ \$7. IC Charcoals—Melyn grade, \$6.50; for each additional X add \$1.50; Allaway grade, \$5.95; Grange grade, \$6; for each additional X add \$1. Charcoal Ternes—Worcester, 14 x 20, \$5.75; do., 20 x 28, \$11.50; M. F., 14 x 20, \$7.50; do., 20 x 28, \$15.50; Dean, 14 x 20, \$5.25; do., 20 x 28, \$10.50; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10; Mansel, 14 x 20, \$5.25; do., 20 x 28, \$10.25; Allyn, 14 x 20, \$5.25; do., 20 x 28, \$10.35; Dyffryn, 14 x 20, scarce; do., 20 x 28, \$11. Wasters—S. T. P. grade, 14 x 20, \$4.90; do., 20 x 28, \$9.70; Abercarne grade, 14 x 20, \$4.90; do., 20 x 28, \$9.60.

## New York Metal Exchange.

The following sales are reported:

THURSDAY, September 10.		
25 tons Tin, September.....		20.05¢
10 tons Tin, November.....		20.10¢
(Seller's right to double.)		
16 tons Lead, September.....		4.50¢
FRIDAY, SEPTEMBER 11.		
10 tons Tin, September.....		20.00¢
45 tons Tin, October.....		20.15¢
20 tons Tin, November.....		20.05¢
2 tons Tin, October.....		20.00¢
35 tons Tin, September.....		20.00¢

## Coal Market.

The Philadelphia *Ledger* makes the following statement in regard to the Anthracite Coal trade:

The Anthracite Coal trade will tomorrow put into effect the September circular prices for Coal, and all unfilled orders taken at the old figures (prior to September 1) will be canceled. The presidents of several of the Anthracite mining and carrying companies have issued instructions to their sales agents that their new prices must be enforced, and that no contracts will be accepted below the net published

prices. The mandate of the presidents to their mining superintendents, ordering them to curtail the production of Coal to prevent any further demoralization of the trade, and, if possible, improve the condition of affairs, has resulted satisfactorily, and already the benefit is seen in the improved tone of the market. From now on the demand for Coal will increase, and if enlarged consumption makes it necessary the output will be accordingly increased and prices will also be further advanced.

In this city the improvement announced is viewed with some skepticism, and we continue to quote as follows: \$2, f.o.b., for Lehigh Pea and \$2.10 @ \$2.15 for Free Burning; \$1.50 @ \$1.60 for Buckwheat, all f.o.b.

Reports from the shippers of Bituminous Coal continue moderately favorable, but prices are unchanged. Vessel freights are still unsettled, the rates from Philadelphia to Boston continuing at 60¢ @ 65¢, while the rate from New York is 40¢ @ 50¢. From the West come reports of an improvement in Bituminous Coal, notably in Pittsburgh, where the change from natural gas to Coal on the part of a large number of mills has considerably increased inquiries.

The report of the Secretary of Internal Affairs on the Coal-mining business of Pennsylvania for the last statistical year shows, for the Anthracite region, 40,090,355 tons of Coal produced, 28,975 miners employed, 18,620 mine laborers, 21,861 other employees inside mines, 37,808 outside of the mines. For the Bituminous region the statistics show 40,730,521 tons produced, 44,310 miners employed, 2735 miners' laborers, 8098 other inside laborers, 12,640 outside employees.

## British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, September 16, 1891.

The Pig Iron warrant market has been firm. Sales were made on Tuesday at as high as 47/8 for Scotch, 40/10½ for Cleveland, and 50/6 for Hematite. The absence of any radical change in the statistical position is remarkable. Latest returns show 501,000 tons Scotch and 153,000 tons Cleveland in warrant stores, or practically the same that have been recorded for over a month. This serves to give the market tone, but the uncertainty as to the purposes of the London syndicate restricts operations. More business has been done in Cleveland and Hematites than for some time past, under the stimulating influence of improvement in some branches of the Steel and Manufactured Iron trades latterly, and better prices offered nearly all around. Latest sales of warrants were at 47/6 for Scotch, 40/6 for Cleveland and 49/9 for Hematite.

The Pig Tin market has been rather quieter, and prices receded to £91 for prompts on Tuesday. The tendency appeared to be in buyers' favor, as some holders manifested anxiety to realize. At the decline, however, there was an improved demand for forwards. Stocks here are still moderate and chiefly in strong hands.

Copper has been quieter the past week, and prices for Merchant Bars receded somewhat. This was due chiefly to holding back on the part of buyers. Supplies are still sparingly offered. Consumers act



as though inclined to resist an advance, but the quantity of Copper in their hands is believed to be moderate, and there is little disposition to realize on the part of the chief holders.

Tin Plate has been quiet, with business confined chiefly to small orders for San Francisco and the continent. Considering the smallness of demand the market keeps surprisingly firm. The output is much below the normal point, and several mills are only partially employed.

**Scotch Pig Iron.**—Makers' Iron is in somewhat better demand, and prices are showing more firmness.

No. 1 Coltness, f.o.b. Glasgow.....	59/
No. 1 Summerlee, " ".....	57/
No. 1 Gartsherrie, " ".....	57/
No. 1 Langloan, " ".....	58/6
No. 1 Cambro, " ".....	48/6
No. 1 Shotts, " at Leith.....	59/6
No. 1 Glengarnock, " Ardrossan.....	57/6
No. 1 Dalmeilington, " ".....	51/
No. 1 Eglinton, " ".....	50/
Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.	

**Cleveland Pig.**—There is quite a brisk trade and the market is firm at 40/6 for No. 3 Middlesborough, f.o.b.

**Bessemer Pig.**—Sales have been of fair volume and prices are firm at 51/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

**Spiegeleisen.**—There is little doing and prices are without change. English 20 % quoted at 95/, f.o.b. shipping port.

**Steel Rails.**—Very little improvement in the demand and prices without change. Heavy sections quoted £4. 5/, and light sections £4. 15/ @ £5. 5/, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—The market remains very quiet. Makers quote £4. 5/ for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—Demand continues rather slow and prices still in buyers' favor. Bessemer, 2½ x 2½ inches, quoted at £4. 7/6, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—Demand is light and makers' prices are unchanged. Bessemer quoted at £4. 7/6, f.o.b. at N. W. England shipping point.

**Old Iron Rails.**—There is more inquiry and the market looks firmer. Tees quoted at £2. 17/6 @ £3 and Double Heads £3 @ £3. 2/6, f.o.b.

**Scrap Iron.**—Demand slightly better. Prices without change but firmer. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

**Crop Ends.**—There is more inquiry at old prices. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

**Tin Plate.**—The market is wholly unchanged. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....	14/9 @ 15/6
IC Bessemer Steel, Coke finish.....	13/6 @ 13/9
IC Siemens " ".....	13/9 @ 14/
IC Coke, B. V. grade.....	13/ @ 13/3
Charcoal Terne, Dean grade.....	13/ @ 13/3

**Manufactured Iron.**—Business is fairly active and the market shows better tone, with a further advance in price of Staffordshire Sheets. We quote, f.o.b. Liverpool:

Staff. Marked Bars.....	£ s. d. @ 8 10 0	£ s. d. @ 8 10 0
" Common ".....	6 10 0 @ 6 12 6	6 12 6 @ 6 12 6
Staff. Bl'k Sheet, singles.....	7 5 0 @ 7 5 0	7 5 0 @ 7 5 0
Welsh Bars (f.o.b. Wales).....	5 12 6 @ 5 15 0	5 15 0 @ 5 15 0

**Pig Tin.**—The market steady at the close, but quiet. Straits quoted at £91, spot, and £91. 10/ for three months' futures.

**Copper.**—Market closes rather easy and quiet. Merchant Bars quoted at £52. 10/, spot, and £52. 2/6, three months' futures. Best Selected, £56.

**Lead.**—Demand is fair and the market steady. We quote at £12. 2/6 for Soft Spanish.

**Spelter.**—A fair business and the market steady at £23. 15/ for ordinary Silesian.

Comparative Value of Steam Boiler and Pipe Coverings.

At a recent meeting of the British Association, W. Hepworth Collins described some experiments he had made on the comparative value of various substances used as non-conducting coverings for steam boilers and pipes. A mass of each material to be experimented upon, 1 inch thick, was carefully prepared and placed on a perfectly flat iron plate or tray, which was then carefully maintained at a constant temperature of 310° F. The heat transmitted through each non-conducting mass was calculated in pounds of water heated 10° F. per hour. The author summarized his results in two tables, which give the data in so convenient a form that we quote them.

Table I.			
Substance 1 inch thick (in mass); heat applied, 310° F.	Pounds of water heated 10° F. per hour through 1 square foot.	Solid matter in 1 square foot 1 inch thick, parts 1000.	Air included, parts 1000.
1. Hair felt.....	11.4	189	957
2. Cotton felt.....	10.6	75	930
3. Jute felt.....	13.2	162	921
4. Linen felt.....	11.7	64	753
5. Loose cotton felt.....	9.3	17	960
6. Carded cotton.....	8.1	16	987
7. Rabbit-hair "wool".....	7.1	43	912
8. Poultry feathers.....	6.2	44	976
9. Cork powder.....	13.6	66	931
10. Sawdust powder.....	14.2	141	793
11. Asbestos powder.....	47.9	67	961
12. Fossil meal.....	52.1	78	910
13. Plaster of Paris.....	36.2	371	598
14. Calcined magnesite.....	14.7	24	979
15. Compressed calcined magnesite.....	53.4	201	711
16. Fine sand.....	60.3	533	473

Table II.		Pounds of water heated 10° F. per hour by 1 square foot.
Prepared mixtures for covering steam pipes, &c.:		
1. Clay, dung and vegetable fiber paste.....		30.6
2. Fossil meal and hair paste.....		10.4
3. Fossil meal and asbestos powder.....		26.3
4. Paper pulp, clay and vegetable fiber.....		44.6
5. Paper pulp alone.....		14.7
6. Stag wool, hair and clay paste.....		10.0
7. Asbestos fiber, wrapped tightly.....		17.9
8. Coal ashes and clay paste wrapped with straw.....		29.9

The T. C. Dill Machine Company of Philadelphia have recently completed a new drill press that in addition to being thoroughly sensitive and balanced on a new plan, has a lathe-turned standard that permits the table to be adjusted on either side for convenience, and is slotted to facilitate centering work. The table is made in three styles, round, square and bell shaped. It is adapted for general work.

Torpedo Boats for the Navy.

Secretary Tracy recently made the following statement concerning torpedo boats: All of our latest ships are designed to carry torpedoes. When, therefore, we have determined upon the torpedo which we are to use, every vessel must be completed at our navy yards by the insertion of its torpedo tubes and launching apparatus, and our officers and men must be taught on home stations how to use them. In January, 1889, my predecessor made a contract with the Hotchkiss Ordnance Company to manufacture the Howell torpedo, by which contract the company were bound to deliver their first torpedoes in July, 1890. The time for the completion of this contract has been extended from time to time, but no deliveries have to the present date been made. The company supposed, early in 1890, that they had produced a successful torpedo. The several trials which were had at Newport proving unsuccessful, however, the Department deemed it unsafe to rely longer upon the Howell torpedo, and in May, 1890, took steps to acquire the Whitehead torpedo, the most successful auto-mobile torpedo in use in Europe. The contract was made with an American firm, by which the first Whitehead torpedo is to be delivered in November of this year. In the meantime the Hotchkiss Company have been prosecuting their experiments with the Howell torpedo, and are now ready for another trial. It is hoped that before the close of the present year we shall succeed in producing a successful torpedo, and that we will then be in position to go on and complete our ships, which are at present, for the reasons given, by no means in a condition of normal effectiveness.

A catalogue of more than usual interest, from the number of new and excellent specialties it illustrates, just reaches us from the Stow Flexible Shaft Company, Limited, of Philadelphia, to whose inventions the Stow flexible shaft almost entirely owes its popularity for practical use, and the new goods they now offer open a field for it of wider scope. Some of the new things are a corner drill press capable of drilling a hole 1½ inches from a corner, a new drill rest and support which prevents the tool from dropping from its weight after the drill has completed its work, a feature that will be appreciated by the operator, and a new tool for heavy reaming. A tool designated as an air port cutter is alike useful to boiler makers, shipbuilders and others who have to cut holes of different and large diameter in iron plates. A new universal joint greatly overcomes the wear on the shaft where it is connected with the motor power, and adapts it for use with electric motors, for the wires can be run to any point under any conditions, and a positive power applied where it was impossible in the past. A sandpapering machine that can be used on the finest woods is another labor-saving appliance. A miter clamp that has a second clamping screw at right angles with the principal screw is a tool that will be popular with wood workers on sight.

A disastrous fire took place at the extensive works of the Delaware Iron Company, at Newcastle, Del., on the evening of September 12. The loss is estimated at about \$300,000, but we are informed by an officer of the company that it will not interfere with the prompt filling of orders, and that they expect to be in running order again some time during next week.

The plant of the Montgomery Iron Works, Montgomery, Ala., is being enlarged.

# HARDWARE.

## Condition of Trade.

**T**HE IMPROVEMENT which we have noted in recent issues in the volume of business continues, but in most of the Hardware centers it is not as yet exceptionally heavy. The condition of trade in the leading markets is reflected in the special reports given in the following columns, most of which, it will be observed, are characterized by a confident tone. While it is evident that the trade at large, including both jobbers and manufacturers, are not disposed to order in a speculative way or to anticipate their wants more freely than usual, a fair business is doing, and the outlook is regarded as exceedingly favorable. It is thought that the fall trade, under the stimulus of large crops and excellent prices, must be large, and that a general commercial activity will result, which will probably be felt in a more marked degree in next season's business. Some surprise is expressed that prices, in this condition of things, do not manifest increased strength, the fact being that they remain substantially where they have been for some time, some staple lines being characterized by a somewhat irregular tone. Some buyers are taking advantage of this, and placing orders more freely for goods which are now recognized as exceptionally low, and in which a further decline is not anticipated. The trade as a whole, however, are apparently waiting until some definite indications come of returning strength, before placing their orders for more goods than will be needed in the near future. There is a good deal of complaint in regard to collections, which are generally referred to as slow, but this is not unusual at this season, and the financial outlook is regarded as excellent.

### St. Louis.

(By Telegraph.)

Jobbers of Hardware continue to report a large and increasing trade. Shelf Goods are moving in large quantities, and out of town orders, as a rule, call for general assortments. Wire Nails are somewhat demoralized, and during the past week have been sold at what are considered very low prices. Window and Plate Glass is in good demand, but manufacturers appear uncertain regarding the future prices and are firm. It seems certain that higher figures will shortly prevail. Copper does not improve. A large trade is transacted in Guns and Ammunition, as is expected at this season of the year. Money is a trifle easier, and collections show some im-

provement. The crops have begun to move, and general business is beginning to feel the anticipated effect.

### Chicago.

(By Telegraph.)

The Shelf Hardware business is still improving. The better condition of trade noted last week not only holds its own but gains are being made. There is no boom, however. Orders are very numerous, but they are not as large as the jobbers would like to see them. Country merchants are evidently not stocking up, but are waiting until they are forced to do so. Meanwhile the improved trade is shown in their more frequent purchases. The demand for staple goods is not specially heavy, and they are being sold so close that jobbers complain of the lack of profit on the business done. Here and there concessions are being made which induce an unsettled feeling. Outside jobbers are not strictly adhering to the Chicago scale of prices, while Chicago jobbers themselves are not as firm as they might be. Stove boards have been cut to some extent, not because manufacturers have weakened, but because some of the jobbing houses are evidently anxious to run their stock off more rapidly. Good trade and irregular prices seem to be an incongruity, and yet that is the condition of affairs at present. When the World's Fair was first agitated it was expected that a heavy local demand for Hardware would be a feature of the work of preparation. This proves to be the case, large quantities of Nails, Galvanized Iron and other Iron and Steel products being consumed in the construction of the buildings. Outside of the fair grounds there is also much activity in building induced by the fair, but prices have not been stiffened. On the contrary, contractors are specially favored by very low prices, perhaps as low as were ever known in this part of the country, if not lower.

### Louisville.

W. B. BELKNAP & Co.—The demand for staple goods is decidedly active, but there is thus far no change in the tone of the market as regards prices. The weather is propitious for maturing crops and the outlook for business continues very promising.

### New Orleans.

A. BALDWIN & Co.—Business shows signs of renewed activity and there is a perceptible improvement in the demand. The outlook is regarded as hopeful, notwithstanding some unfavorable reports in regard to cotton. There is an improved demand for Wire Nails and buyers are placing their orders more freely.

### Boston.

BIGELOW & DOWSE.—There is a marked improvement in business since our last report and but few changes in prices. We note a firmer feeling in Barbed Wire since

Washburn & Moen have given up making deliveries and now quote only f.o.b. Boston or Worcester. The Wire Nail market has been disturbed of late by a large lot of Nails held here on storage, but we understand these have been sold. This should remove a disturbing element and prices should be firmer. Up to the present none of the dealers have been able to realize the late advance in freight from the mill. Price from store is \$2.15 to \$2.20. The sale of Axes is increasing, and the strike in the American Axe and Tool Company's factories, which was inaugurated two weeks ago, makes heavy drafts on the jobbers' stocks. No one complains of the prices at which Axes are being sold, and if the strike continues there will be a short supply, and late buyers will find a difficulty in supplying their wants. Money seems to be a scarce commodity among the retail dealers. They all complain, but it is hoped the revival of business will soon put them in better shape.

### Philadelphia.

SUPPLER HARDWARE COMPANY—The volume of trade is somewhat in excess of the preceding two weeks, and the future prospects are quite as flattering as they have heretofore been. Customers continue to report improvement in the manufacturing districts, and the best of feeling in the agricultural districts, but the farmers, as a rule, are kept busy at home, consequently but little of them will be seen for the next few weeks to come. Customers are assorting their stocks of goods to place themselves in a fair condition for the trade which must come upon them at a later date. Cooler weather must naturally be looked for, and this always has the effect of driving the farmers into the nearest towns for supplies. Travelers are sending in good and fairly assorted orders, and a fair improvement is noticeable in collections. Prices continue without any material change, and we find it necessary to anticipate our wants, as we find manufacturers have no overstock of goods on hand. The railroads are taxed to their utmost capacity with Eastern bound freight, considerable of which is to fill export orders.

### Baltimore.

CARLIN & FULTON.—We are pleased to report the continued activity in trade, though the volume of business is less than at this time last year. Should favorable weather follow the incessant rains which have prevailed in some portions of the South and allow cotton picking to progress, trade, we think, from that section will improve, especially as there has been some advance in the price, and the indications now are that good grades of cotton will bring a satisfactory price in a little while. We regret to see that whereas speculation had forced wheat and corn to figures possibly beyond what they should have been, it has just now reduced them



correspondingly, but we do not believe that the present prices for cereals will continue long enough to affect trade, and that during the balance of the year we will all experience a good business from all sections, both through orders per mail and from our traveling salesmen. As usual at this time of the year the remittances are very light, and the probabilities are that they will so continue for some time yet. Prices remain almost unchanged, and we do not think that our customers hazard much in keeping well stocked, as further declines are hardly possible.

#### Omaha.

**LEE-CLARKE-ANDRESEN HARDWARE COMPANY.**—In Hardware there have been no especial new developments of any significant importance. The general characteristics of this market have undergone no particular change during the past week. Jobbers are very well disposed to believe that they are entering upon a period of increasing business. They have already experienced some of the symptoms and have good evidence on which to build hopes that buyers must increase their purchases very shortly. The recent pleasant weather has been very grateful to those who have been watching the development of the corn crop. It may be said that every day of sunshine adds to the confidence with which business men view the outlook. The extra heavy fall trade which was expected and predicted by some philosophers has not yet materialized, but it cannot be denied that the prospects are of the most flattering kind. A big crop with high prices is a dual condition seldom enjoyed. But it must be remembered that last year the farming community were behind in financial matters, with only fair products to help them out, but have gradually worked into better shape, and now with excellent crops promising good average returns, it is probable they will fully clear themselves and have something to spare. It is only reasonable to expect that incumbrances must first be removed, and after that it is also reasonable to expect a very active development in the volume of business transactions a little later on.

#### Cleveland.

**THE W. BINGHAM COMPANY.**—Probably not since 1879 has Ohio yielded such crops as she has this year—wheat, oats, corn and fruits of all kinds in abundance. This will enable the farmers to pay up their old scores and take a fresh start. It may not affect trade so much this fall, but it will surely have its effect latter on. Business is on the increase, and travelers are sending in good, assorted orders. We do not note any change in prices since our last. The weakness of the Wire Nail market still continues, as does that of Sheet and Bolt Copper. Collections are fair.

#### San Francisco.

**HUNTINGTON-HOPKINS COMPANY.**—There has been no change since our last report. Shelf Hardware is not in very great demand and the call for Staples has not improved. The demand for Cut and

Wire Nails shows no strengthening. Collections are fair. The condition of trade as noted two weeks ago has undergone no marked change and the market presents no specially new features.

#### St. Paul.

**FARWELL, OZMUN, KIRK & Co.**—Trade thus far equals expectations, and prices are generally well maintained. The harvest is over and the crop reports are very satisfactory. Collections are still slow, but it is thought will soon be much easier. A heavy fall trade is confidently expected.

#### Portland, Ore.

**FOSTER & ROBERTSON.**—There is little change of importance to note since our last letter. Trade for the closing days of August was somewhat lighter than during the early part of the month, while for September so far the volume of business is also moderate. The unusual acreage and the very heavy yield of grain has kept farmers very busy for some weeks past, and will probably keep them tied up for a week or two longer. This has very naturally affected the volume of trade, but at the same time it gives positive assurance of a large amount of business to be done as soon as the harvesting is over. We are pleased to note a slight change for the better in the logging and lumber interests. This is due, doubtless, in a great measure to the general expectation that the closing of the Chilean war will result in a revival of trade with South American ports, which until the breaking out of the war were the principal markets for the surplus products of the Puget Sound territory. There have been no particular changes in prices, a slight decline on Rope being about the only thing worthy of note. The quotations at present are as follows: Pure Manila, 12 cents, base; Eastern grade Manila, 10 cents, base; Sisal and Duplex, 8 cents, base.

### Notes on Prices.

**Wire Nails.**—During the past week the market has developed no new features. Many orders are being placed by the trade and the mills are generally well occupied. It is reported that some large orders have been placed at concessions beyond figures which have been publicly named. The market, however, as a whole, cannot be said to have weakened, its tone continuing substantially as for several weeks past. Quotations are on the basis of \$1.85 to \$1.90 for carload lots at mill, and \$2.10 to \$2.15 for small lots from store.

**Chicago, by Telegraph.**—The volume of business is said by manufacturers to be all that they could desire. Orders are numerous, and often run to large quantities. Prices, however, do not improve, and there seems to be no way in which they can be improved until raw material advances. It is claimed that at present rates the manufacturers are barely realizing cost, and yet some of them are taking orders as freely on this basis as though they had a good round profit on everything. They nominally quote \$2 for Chi-

cago delivery. Jobbers adhere to their old quotations of \$2.10 to \$2.15 from stock.

**Cut Nails.**—The market gives little evidence of improvement, prices continuing as for several weeks, with a fair but not heavy demand. Quotations in the East are on the basis of \$1.50 @ \$1.55 for Steel or Iron Nails in carload lots at mill, with the usual 25 or 30 cent advance. Nails in the Wheeling district are held at \$1.60, but this price is sometimes shaded.

**Chicago, by Telegraph.**—Manufacturers report good inquiries, and they are trying to advance prices at least 5 cents per keg. A movement is on foot to have an early meeting of the Western trade to adopt concerted measures to improve the condition of the Nail business. It is believed that with the improving outlook for general business an advance in raw material is imminent and that arrangements should now be made to meet such a contingency. Prices for factory shipments, Chicago delivery, range about \$1.70 for 25-cent average. Jobbers quote \$1.75 to \$1.80 from stock.

**Barb Wire.**—The Barb Wire market is characterized by regularity and a good demand. Manufacturers report an increased business and refer to things as working smoothly, as prices are well maintained and the trade are accepting the existing arrangements. The market as a whole is characterized by an excellent tone.

**Chicago, by Telegraph.**—Business is reported to be looking better from manufacturers' standpoint. Orders are coming in more freely as old contracts expire. Prices are unchanged, jobbers now adhering strictly to the manufacturers' schedule.

**Cordage.**—A decline of  $\frac{1}{4}$  cent per pound has taken place in the price of Manila and Sisal Rope. Manufacturers' prices in large lots, f.o.b. factory, are as follows; terms, 60 days,  $1\frac{1}{2}$  per cent. discount for cash in 10 days:

	Per pound.
Manila, $\frac{1}{8}$ inch and larger.....	8 $\frac{3}{4}$ ¢
Manila, $\frac{3}{8}$ inch.....	9 $\frac{1}{4}$ ¢
Manila, $\frac{1}{2}$ and 5-16 inch.....	9 $\frac{3}{4}$ ¢
Manila, Tarred Rope.....	8 $\frac{3}{4}$ ¢
Manila, Hay Rope.....	8 $\frac{3}{4}$ ¢
Sisal, $\frac{1}{8}$ inch and larger.....	5 $\frac{1}{2}$ ¢
Sisal, $\frac{3}{8}$ inch.....	6 $\frac{1}{2}$ ¢
Sisal, $\frac{1}{2}$ and 5-16 inch.....	6 $\frac{3}{4}$ ¢
Sisal, Hay Rope.....	5 $\frac{1}{2}$ ¢
Sisal, Tarred Rope.....	5 $\frac{1}{2}$ ¢
Sisal, Medium Lathe Yarn.....	4 $\frac{1}{2}$ ¢
New Zealand, $\frac{1}{8}$ inch and larger.....	5 $\frac{1}{2}$ ¢
New Zealand, $\frac{3}{8}$ inch.....	6 $\frac{1}{2}$ ¢
New Zealand, $\frac{1}{2}$ and 5-16 inch.....	6 $\frac{3}{4}$ ¢
New Zealand, Hay Rope.....	5 $\frac{1}{2}$ ¢
New Zealand, Tarred Rope.....	5 $\frac{1}{2}$ ¢

This reduction is made by the National Cordage Company to meet prices made by outside manufacturers, and also in view of the condition of the Hemp market. The demand is only moderate.

**Snaths.**—The organization of the National Snath Company, with headquarters at Auburn, N. Y., H. P. Sullivan, manager, is announced. In this company it is understood that nearly all the manufacturers of Snaths in the country are interested, and its object is to give regularity to the market in these goods and secure more remunerative prices than have for some time been realized. During the past season especially the manufacture of these goods is referred

to as unprofitable owing to the keen competition between the different makers. It is understood that the National Snath Company will market the production of the various factories. No definite announcement of prices for the coming season has yet been made, but the market has a decidedly firm tone. Manufacturers are refusing to accept orders at the recent prices, and are taking them only at such figures as may hereafter be determined upon. The trade are awaiting with interest more definite announcement in regard to the constitution and action of the company. At the present time it would appear as if the plans had been so carefully and judiciously made and carried out as to secure the control of the line of goods to which they relate.

**Carriage Bolts.**—The market for Common Carriage Bolts continues without new features, matters running along with their usual regularity. In Philadelphia Pattern Carriage Bolts there has, however, for some time been a lack of uniformity in the prices of the different manufacturers. With a view to correcting this a conference was had last week, the result of which was the reaching of an understanding by which an extreme price was determined upon, which was a slight advance on the lowest prices which have recently been ruling. A slight advance was also made in the prices of Eagle Bolts.

**Oil Stone.**—The Oil Stone market is decidedly firm, and slight advances have recently been made by Pike Mfg. Company, Pike Station, N. H., for whom John H. Graham & Co. are agents, 113 Chambers street, New York.

**Shot.**—A change in the classification of Shot was made by the associated manufacturers under date September 10. As a result of this change the price of B Shot will be the same as BB and other larger sizes. No change was made in quotations, which are as follows, in ton lots, terms net 30 days, or 2 per cent. discount for cash in ten days.

Drop Shot up to B, 25 lb bag.....	\$1.42
Drop Shot up to B, 5-lb bag.....	.35
Drop Shot, B and larger, 25-lb bag....	1.67
Drop Shot, B and larger, 5-lb bag.....	.40
Buck and Chilled, 25-lb bag.....	1.67
Buck and Chilled, 5-lb bag.....	.40
Dust Shot, 25-lb bag.....	2.00
Dust Shot, 5-lb bag.....	.45

In smaller quantities than ton lots 5 cents per bag advance on above prices is charged. Freight is equalized with any freight manufacturing point.

The demand is referred to as fair, but the trade are not ordering beyond their early requirements, as Shot is regarded as relatively high, in view of the condition of the Lead market.

**Rubber Goods.**—The condition of the market in Rubber Belting, Hose, &c., remains without material change, notwithstanding the recent decline in the raw material. This decline is not thought likely to affect prices in this line, owing, in part, to the fact that the manufacturers have not been paying for their Rubber the high prices which have recently been ruling, and it is also intimated that even in goods of excellent quality the cost of Rub-

ber bears a small proportion of the cost of the other materials and of the labor.

**Malleable and Cast-Iron Fittings.**—The market in this line continues in a demoralized and unsatisfactory condition. There is no agreement among the manufacturers, and prices are described as very irregular and unremunerative. Owing to the unevenness in quotations of different manufacturers the trade, in order to buy advantageously, find it necessary to compare prices of several manufacturers. The demand, however, is good, and some of the makers report that they are exceptionally full of orders. Owing to the indisposition to concerted action there appears to be no immediate prospect of an improvement in prices.

## Trade Items.

**STEAM GAUGE AND LANTERN COMPANY,** Syracuse, N. Y., have recently adopted a new process of plating their Lanterns, known as Brasso-line. It is a brass plating, and is referred to as rendering the goods rust proof. We are advised that there is a large demand for these goods, and that they are meeting the approval of the trade.

**FEATHERBONE,** the material used by the Featherbone Whip Company, Three Oaks, Mich., is made of enameled quills, and is described as flexible, tough and fibrous, possessing elasticity, strength and durability. In its manufacture the fibers are intertwined, which gives it a thread-like character. It is stated that water, heat of the sun or the action of climate do not injure it, and that the ammonia from the stable does not affect it as it does whalebone. It is referred to as possessing more the nature of whalebone than any other known material, and is cheaper than whalebone.

IN A RECENT ISSUE the Youngstown, Ohio, *Telegram* refers to the Morris Hardware Company of that city as having a large and well arranged store, fronting 45 feet on Federal street and 40 feet on Market street, making full length of 190 feet, four floors, with warerooms 40 x 200 feet, corner of Wick and Champion streets, with their own railroad switches. Mr. Morris is general manager of the company, and has been identified with the Hardware business in Youngstown since 1865. Their stock consists of a general line of shelf and heavy Hardware, Stoves, House-Furnishing Goods, Railroad, Mill and Mine Supplies, Paints, Oils, &c. Their traveling men cover the territory from the lakes to Central New York, also a portion of Pennsylvania and Ohio.

**H. H. PERKINS MFG. COMPANY,** Kewanee, Ill., manufacturers of the Perkins Boss Huskers, report that the demand for these goods during the present year has obliged them to run their factory through the winter and spring on 12-hour time. From 25 to 35 hands are employed the year around and extra help during the busy season. The pins are forged from steel, polished and nicked, after which they are strapped with soft, tough leather. It is stated that the Pin is of such shape that the wearer commands a firm hold upon it, and all adjustments can be made instantly. This is the fourth year these goods have been upon the market.

IN AN EXPLOSION at Owensboro, Ky., on the 12th inst., the paint house attached to William Lossie & Sons' tinshop, together with some adjoining sheds, was destroyed by fire. Mr. Lossie and his son had gone to the paint house with a lighted lamp, and had no more than gained

entrance when the explosion occurred, both parties being considerably stunned and the former somewhat seriously burned. It has been ascertained that the room contained a barrel of gasoline, which was leaking, and to this is attributed the origin of the explosion.

**DAVID ROBERTSON** of Foster & Robertson, Portland, Ore., has returned from his European trip, during which several months were spent on the Continent and in Great Britain.

**PIKE MFG. COMPANY,** Pike Station, N. H., are putting up a new factory for the manufacture of their Indian Pond Scythe Stone, by which their facilities will be doubled.

**THE OLD CRANDALL BARB WIRE FACTORY** at 51 and 53 Michigan street, Chicago, which has for some time been idle, has been sold to J. Timmons of Harden County, Ohio, who is reported to have paid \$90,000 for it, and a company to be known as the Alliance Wire Company will operate the factory, having a license for about 5000 tons. The new owners will sell their product on an independent basis.

**THE STANDARD FIBER WARE COMPANY** of Mankato, Minn., send us a very handsome photograph, 8 x 10 inches in size, of some 24 pieces of their ware, comprising Water Pails, Slop Jars, Cuspidors, Toilet Pitchers and Bowls, Fire and Prison Buckets, Wash Basins, &c., both plain and decorated. The specimens photographed show up elegantly, being arranged on a platform of three steps, with a background of drapery which forms a pretty setting for the goods.

IN A PARAGRAPH in *The Iron Age*, September 3, relating to A. J. Phillips & Co., manufacturers of Wooden Ware, Fenton, Mich., we mentioned that they had accumulated 100,000 feet of lumber to be used in making Screens for the coming season. Our readers doubtless recognized that the accumulation was not a very formidable one, the number of feet specified cutting a rather small figure in the Screen business. The fact is that the stock of Messrs. Phillips & Co. is considerably over 1,000,000 feet, and as the item referred to may have been somewhat misleading, we take pleasure in making this correction.

**THE TRADE** will observe among our advertising pages the illustration of the Burton Trap manufactured by Orr & Lockett Hardware Company, 184 and 186 Clark street, Chicago, Ill. Reference is there made to some of the advantages of this Trap and the efficiency with which it does its work.

**FOSTER, STEVENS & Co.,** Grand Rapids, Mich., in a postal announcement call attention to the fact that September 14 to 20 will be Fair week, and invite their friends to come and see them, as their "latch string is out."

**THE EXPOSITION** to be held at Portland, Ore., this fall, will, it is predicted, be superior in its attractions to all previous exhibits on the Pacific Coast, no efforts being spared to make it a substantial success. Staver & Walker of Portland, will, we are advised, make a large and creditable display of their well-known line of Machinery and Vehicles, of which they carry a varied and complete stock.

## C. M. McClung & Co.

**A NEW CATALOGUE** has recently been issued by C. M. McClung & Co., Knoxville, Tenn. It represents the large assortment of goods carried by them, in the display of which nearly 800 pages are occupied. The volume opens with illustrations of their office and salesrooms,



188 and 190 Gay St., and of their warehouse for Heavy Hardware and Stoves, 109 and 111 West Jackson St. In the early pages the catalogue gives the lists of Iron and Steel, Chain, Wire, Plain and Barb, Horse Shoes, Nails, &c., and then passes to the illustration of the many lines of other leading goods and specialties carried in stock, with appropriate descriptive matter. Throughout the catalogue care evidently has been taken to secure a compact arrangement and at the same time to suitably represent the goods. Many of the illustrations were specially made for this volume, among which may be mentioned the excellent cuts representing their well known line of Cranberry Axes and Hatchets. Giving as the book does such a satisfactory exhibit of General Hardware, Cutlery, Guns, House-Furnishing Goods, &c., it will be appreciated by the trade. It should be added that the index is very complete and given such typographical arrangement as to make the names of the different goods prominent, thus facilitating its use.

### Price-Lists, Circulars, &c.

**THOMAS A. LAMOTTE**, Philadelphia, Pa.: Husking Gloves and Corn Huskers. The Gloves are made in orange tan, yellow sheep skin, yellow calf, hog skin, buck skin, Indian tan, &c., with steel disks, washers and husking pins. Corn Huskers are shown with straps, finger cots and thumb cots.

**J. W. FOLEY & Co.**, Cincinnati, Ohio: Machine-Molded Pulleys, Hangers, Journal Boxes, &c., and Castings for the same, also manufacturers' Castings of every description made to order. They have a full line of standard metal patterns and special molding machines for the purpose of supplying machine shops with first-class standard castings at a very moderate price. The point is made that a machine shop of very moderate pretensions can thus take contracts direct for line power transmission of any extent and compete with shops having their own foundry.

**CHARLES J. GODFREY**, 7 Warren street, New York: Shot Guns, Rifles, Revolvers, Ammunition, Safety Bicycles and general sportsmen's goods. Special price-list No. 403 contains illustrations and prices of these goods, of which the assortment is large. Attention is called to two pages of special bargains in double breech-loading Shot Guns, Rifles and muzzle-loading Guns.

**J. R. CLANCY**, Syracuse, N. Y.: Theatrical Stage Hardware, Calcium Light Apparatus. Importer of Scenery, Canvas, &c. Compressor of Oxygen and Hydrogen Gases, in cylinders, for the road. In this, his seventh annual catalogue, it is stated that, as in the past, it will continue to be his constant aim to make Theatrical Stage Hardware of the most approved patterns and of the best material and workmanship. Attention is directed to the fact that, while prices are for the most part the same as last year, they are actually lower, in that more is offered for the same money, because the leading styles are better, costing more to manufacture them.

**R. WALLACE & SONS MFG. COMPANY**, Wallingford, Conn.: A finely printed catalogue in which their Sterling Silver Table Ware and Souvenir Spoons are copiously illustrated. The company state that many new and desirable patterns have been added to their assortment of Sterling Table Ware, and refer to the demand for Souvenir Spoons as constantly increasing, being not only collected by the tourist, but used as Christmas, Easter, wedding and birthday gifts, whist and euchre prizes, &c. The company are now estab-

lished in their new factory, which has been constructed and equipped with particular reference to the wants of their business.

**SILVER & Co.**, 56 Warren street, New York: Illustrated sheet showing the large variety of House Furnishing Goods manufactured and put on the market by them. These goods include several new articles, among which may be mentioned Oil Stoves of a new pattern.

**ELASTIC TIP COMPANY**, 157 Washington street, Boston: Catalogue of Rubber Goods and Specialties, of which they are patentees and manufacturers. Among these are included Rubber Chair Tips and Buffers, Crutch Tips, Screw Tips, Hard Rubber Bicycle Handles, Bicycle Tires, Pedal Rubber, Rubber Truck Wheels and Furniture Fenders, illustrations of which, with a variety of other goods, are given. The company have offices also in London, Bombay and Hamburg.

**E. W. ROSS COMPANY**, Springfield, Ohio: Catalogue relating to Ross Fodder and Ensilage Cutters, Carriers for Dry Fodder and Ensilage, R. R. Tread Horse-Powers, Sweep Horse-Powers, &c. The descriptive data touching this line of goods is especially full, many illustrations being also given. The manufacturers state that many valuable changes and new features have been introduced in the goods, making them better adapted to the purposes for which they are designed.

**HEMACITE MFG. COMPANY**, successors to Dibble Mfg. Company, Trenton, N. J.: Illustrated price-list of Hemacite Hardware and House Furnishing, Stationers' and Toy men's Specialties.

**H. H. MAYHEW & Co.**, Shelburne Falls, Mass.: Illustrated catalogue of Hardware and Mechanics' Tools. This is an elegantly printed pamphlet of 47 pages, devoted to Screw Drivers, Goodell's Tool Set, the Goodell Automatic Drill, Shoe Files, Tack Claws, Mayhew's and Hartwell's Double-Cut Bits and Gimlets, German Pattern Diamond Bits, Pod Bits, Countersinks, Screw Driver Bits, Reamers, Punches, Gimlets, Cake Turners, &c.

**LEE-CLARKE ANDRESEN HARDWARE COMPANY**, Omaha, Neb.: Price current, September, referring to such seasonable goods as Axes, Saws, Corn and Hay Knives, Stove Boards, Stove Goods in large variety, Lanterns, Huskers, Apple Parers, Meat Cutters, Skates, &c.

**THE COOK CARRIAGE COMPANY**, Cincinnati, Ohio: Catalogues illustrating their line of Road Carts, Buggies, Carriages, &c.; also a circular relating to their Delivery Wagons with the Cook Short Turn Gear. The company's Diamond edition of their catalogue represents in miniature some of their leading vehicles.

**H. R. VAN EPS**, Peoria, Ill.: Illustrated catalogue and price-list of Novelty Wire and Iron Works, illustrating Van Eps' patent Wrought Iron Fence, Flower Stands in large variety and miscellaneous Wire Goods, such as Card Racks, Music Stands, Book Shelves, Trellises, &c. It is accompanied by a net price-list for the present season.

**JOHN H. SUNDERMAN & Co.**, Quincy, Ill.: Dumb Bells, Quoits, the C' Top, Loose Handle Rolling Pin, &c.

**THE HENRY SEARS COMPANY**, 75 and 77 Wabash avenue, Chicago, Ill.: Circular relating to Guns which they are offering at special quotations. Illustrations are given with descriptive matter and net prices. Also a circular relating to Queen Shears, with prices of different assortments.

**JAMES GROENENDYKE**, Middletown, Ind.: Circular relating to Groenendyke's Favorite Washer. Illustrations of the Washer are given and the advantages connected with its use mentioned, reference being also made to the fact that the machine has been on the market for over eight years.

**IOWA FARMING TOOL COMPANY**, Fort Madison, Iowa: Catalogue for season 1892.

This catalogue, relating to the company's well known line of Steel and Wood Goods, is as usual elegantly printed and conveniently arranged. It contains a complete and satisfactory telegraphic code and evidences the care with which it has been compiled.

### It is Reported—

That the Hardware store of Walter Roberts, Maysville, Mo., was burned out on the 7th inst.

That Irwin Russell, who has been fitting up a store in Madison, Maine, has purchased the Hardware stock of F. A. Williams of Skowhegan, and will remove it to Madison. Mr. Williams will retire from business.

That the firm of Baker & Foster, dealers in Hardware, Beverly, Mass., has undergone a change. Jesse Foster retires from the firm, his interest having been purchased by Frederick Gay of Dedham, a young man of considerable experience in the retail trade in Boston. The firm will hereafter be known as Baker & Gay.

That the Hardware stock in the estate of Chipman Bros., Halifax, Nova Scotia, has been sold to A. M. Bell.

That T. N. Young will shortly open a new Hardware store at McCook, Neb.

That A. M. Olman has purchased the stock of Hardware formerly carried by A. Darrow, Garretson, S. Dak.

That T. J. Wood, Cornwall, N. Y., is erecting a new building, a portion of which will be occupied by his new Hardware store.

That Sutton & Sharpe, Georgetown, Texas, have moved their stock of Hardware into a more commodious building in that place.

That A. R. Eldridge contemplates entering the Hardware business at Bourne, Mass.

That O. E. Leak & Co., have commenced the Hardware business at Lizton, Ind.

That W. R. Dean, dealer in Hardware, Minden, Neb., has taken possession of his new brick store.

That Rufus B. Chandler has opened a Hardware store at De Kalb, Neb.

That the Hardware firm of Barber, Huette & Co., Beatrice, Neb., has become Barber & Ketleson.

That the Southern Hardware Company are a new concern at Shreveport, La.

That Williams Bros. have opened a Hardware store in the Reel Block, Logan, Iowa.

That Samuel C. Turner and George W. Turner will open a Hardware store at Chester, Pa.

That Benjamin Shaffner is the proprietor of a new Hardware store at Joliet, Ill.

That C. M. Loomis has opened a Hardware store at Lincoln, Neb.

That Jeremiah Hall has sold out his Hardware business at Avoca, N. Y., to M. F. Sherman & Son of Greenwood.

That J. W. Morrison has become a partner in the Hardware business conducted by J. N. Smith at Santa Anna, Cal.

That D. W. Stiver, Huron, S. Dak., is a new Hardwareman at that point.

That the Hardware store of William Shakespeare, Waltham, Mass., was robbed on the 7th inst.

That T. L. Hatton & Son have commenced the Hardware business at Bloomfield, Iowa.

That C. M. Bonham & Co., are a new Hardware firm at Raub, Ind.

That the Hardware store of Thomas Dettlinger, Elkhart, Ind., was robbed on the 4th inst. Nearly 200 Pocket Knives, 25 Razors and six Revolvers were secured by the burglars.

Some Old Invoices.

PART I.

ON APRIL 2, 1841, there appeared in the Cleveland (Ohio) Herald the notice as reproduced in Fig. 1, announcing

Bingham, the founder of the house, who still takes an active interest in the business, a few months ago cordially greeted his old friends as they called to offer their congratulations upon the firm's fiftieth anniversary. In 1841 the

ham & Co., thus illustrating in a graphic way the condition of the Hardware trade at that time. In 1841 the postage on a letter from New York to Cleveland was 25 cents. No envelopes or postage stamps were used, but the letter or invoice was folded, fastened with a wafer, and the direction written upon the back. The amount of postage was marked upon the letter. Fig. 2 shows the appearance of mail matter in 1845, with the name of the firm from whom it was received indorsed upon it for filing away. In Fig. 3 it will be noticed that Walsh & Mallory emphasize the fact that they are manufacturers' agents for the sale of domestic Hardware generally, and that especial attention is given to American Locks and Latches, Sliding Door Trimmings, Brass Ship Locks, &c. It will also be noticed that some of the goods in the invoice are priced by the shilling. The invoice from Phelps, Dodge & Co., Fig. 4, is of interest from the fact that this firm is still doing business under the same name, and in the same

NG HERALD, APRIL 2, 1841.

W. BINGHAM & CO. having purchased of Charles Clark & Murfey their entire stock in trade are now offering for sale at their old stand, opposite the American, a good assortment of all kinds of Hardware, Iron, Steel, Nails, Glass, Ship & Boat spikes, Anvils, Vices, Smiths' Bellows, &c., &c. April 2, 1841.

TO THE ELECTORS OF THE CITY AND TOWNSHIP OF CLEVELAND—Having been solicited by my friends to become a candidate for re-election for the office of constable, I believe it my duty to the public, to

Fig. 1.

that W. Bingham & Co. had purchased the stock of Clark & Murfey, Hardware merchants, of that city. The business thus begun in a modest way at that time facilities for doing business were limited; shipments were made by water route, subject to vexatious delays; Hardware was largely imported, as a limited quantity of

PAID  
William Bingham & Co  
Cleveland  
Ohio

Hermann Boker & Co  
Manufacturers  
1845

Fig. 2.

now extends over 16 States and Territories, requiring for its jobbing department the entire building Nos. 146, 148 and 150 Water street, Cleveland, with a large goods were manufactured in this country. Collections were poor, while the circulation of the State banks was subject to a discount of from 1 to 50 per cent. of its business block on Cliff street, as in 1842, though their present location is nearer to John street than at that time. The name Hermann Boker, as appears on the invoice

New-York, August 4 1841

Messrs W Bingham & Co

Bought of **WALSH & MALLORY,**  
No. 211 Pearl-Street,  
Importers of Hardware and Cutlery, and Manufacturers' Agents for the sale of Domestic Hardware generally. SANDERSON BROTHERS & CO'S. Steel.

American Locks & Latches,  
SLIDING DOOR TRIMMINGS,  
BRASS SHIP LOCKS, &c., &c.

16 Trays No 929.	20. 22. 24. 26. 28.	23.25
3 " " 2630.	16. 18. 20. 22. 24. 26.	13.87
12 Lead Pots	P. 10. 12 = 60 4/8 2.70	
	5/10 13	2.57

Fig. 3.

warehouse at the rear reaching to Frankfort street. For the retail department two floors of the Perry-Payne building are used, Nos. 97 and 99 Superior street. Mr. face value. Through the kindness of the W. Bingham Company we are enabled to present some correspondence and invoices relating to the early business of W. Bingham shown in Fig. 5, is a name which has for years been identified with the Hardware trade in New York, and is still perpetuated in the firm of Hermann Boker & Co.









pot Stands that attracted my attention, because of the very dilapidated condition of the packages. There was not a box in the lot that was not so badly broken as to be useless, and on examination I found some of the porcelain tiles in pieces. They were packed by the dozen, in boxes made of thin pasteboard that would hardly have furnished protection for paper flowers, and I was struck with wonder that any one should pack breakable goods in this manner.

To a "man up a tree" it seems that there might be a great deal of improvement in the way some Shelf Hardware is packed. Thin pasteboard boxes may look very well when filled at the factory and packed in cases made to fit accurately a certain number of a specified size, and may reach the jobber in good condition, but after being handled over four or five times by him, repacked in cases with a miscellaneous assortment of goods and suffer the knocking about of another freight haul, it is by a happy chance if they reach the retailer's hands in good order or with any of their first freshness.

It is of importance to the retailer that packages should reach him in good shape. The consumer (whom all, from the manufacturer to the clerk behind the counter, are trying to please) is much more favorably impressed by goods that come from neat looking boxes and that show care in handling than by those carelessly wrapped taken from flimsy or broken packages. A well-made box with an attractive label and (when practicable) an inner wrapping of thin paper will do more to convince an ordinary purchaser of the good quality of the goods than the statements of the salesman, especially if he is not familiar with the article.

The "rooster" aforesaid does not contend that the favor of the consumer depends entirely upon the box or that a neat package can sell a poor article, but it is one of the features of the business that may be well considered. Upon the favor of the consumer as voiced by the retailer depends the patronage of the jobber and the manufacturer's sales. It is poor economy to sacrifice the appearance of the goods to undue reduction of the expense of packing, though margins may be close and the jobbing buyer insistent in his demands for that "extra two and a half."

**Percentage.**—In reply to the following questions relating to percentage, as they appeared in our issue of June 11, we take pleasure in giving replies received from prominent Hardware merchants. The questions and answers are given by number for convenience in comparing them:

1. How to find what per cent. is made on an article, the cost and selling price being known?
2. Is the percentage made by the sale of an article the same per cent. as was added to the cost to make the selling price?
3. What general rule can be applied to answer questions like No. 2?
4. Is there any short method of figuring discounts?
5. Is a business considered a profitable one in which the expenses exceed 10 per cent. of the gross receipts per year?
6. What is considered a fair percentage on the gross sales to allow per year for uncollectable debts?

The following replies are received from a well-known house in the Southwest:

1. Deduct cost from selling price, add to remainder two ciphers and divide it by the cost. The result will be percentage in decimals, thus:

$$\begin{array}{r} \text{Sell } 1.00 \\ \text{Cost } .75 \\ \hline .25 \\ \hline 33\frac{1}{3}\% \text{ profit.} \end{array}$$

2. The percentage made by the sale of an article is the same if calculated from

the same base—viz., the cost—but if calculated from the amount received is, of course, a less per cent. For example, if an article cost 75 cents and sold for \$1, the profit would be 33 $\frac{1}{3}$  per cent. on 75 cents or 25 per cent. of the gross receipts.

3. None that we know of; always calculate from cost, not from what was received.

4. The shortest method for general use is to deduct the discounts from 100 and multiply list by the remainder; the result is the net. Given list of \$4, discount 50, 10, 5 and 2 $\frac{1}{2}$  per cent. taken from 100 leaves 41.68, which, multiplied by \$4, gives \$1.6672.

5. It is too hard for us; it depends on profit account entirely.

6. Depends on the ability of the proprietor to say "No," and his ability to judge men and their ability to pay.

In replies from Cincinnati, given below, it will be noticed that the manner of arriving at the results in the first problem is different from that given by "Yazoo;" and also that answer No. 4 contains additional information which is of especial value:

1. Divide cost into selling price, adding two decimals, and the result over 100 is the per cent. of profit, thus:

Cost.	Sell'g.		Cost.	Selling.	
14c.)	23	(1.57 1-7	1.22 $\frac{1}{2}$ )	1.50	
	14		2	2	
	80		245	300 (1.22 $\frac{1}{2}$ %	
	70			245	
	100			550	
	98			490	
	2			600	
57 1-7 per ct. profit.				490	
				110	
				22 $\frac{1}{2}$ per cent. profit.	

2. The per cent. added to cost to make a selling price is the per cent. profit one makes (if one obtains said selling price), for figures never contradict themselves.

	Cost, 1.00	100	125	(125
Example.—Desire to make	.25		100	
25 per cent.	1.25		250	
			300	
			500	
			500	
25 per cent. profit.				

4. All the above is based upon the assumption that freight, cartage and other incidental expenses have been added to make the cost. Nothing shorter than multiplying the list by the remainder after deducting the per cent. of discount from 100. Thus 62 $\frac{1}{2}$  per cent. discount deducted from 100 = 37 $\frac{1}{2}$  per cent. multiplied by list, say \$5 = \$1.87 $\frac{1}{2}$ . There is the general knowledge that 12 $\frac{1}{2}$  per cent. discount is  $\frac{1}{4}$  off, 16 $\frac{2}{3}$  per cent. discount  $\frac{1}{3}$  off, 20 per cent. discount  $\frac{1}{5}$  off, 25 per cent. discount  $\frac{1}{4}$  off, and so on. To one not extra quick at figures we recommend Ladd's Discount Tables. In this connection it is well to remember that if you buy at 20 per cent discount and sell at list you make 25 per cent.; buy at 25 per cent. discount and sell at list you make 33 $\frac{1}{3}$  per cent.; buy a 33 $\frac{1}{3}$  and sell at list, 50 per cent.; buy at 50 per cent. and sell at list you make 100 per cent.

5. Of course it depends upon what percentage of profit you sell your goods for.

6. Depends upon the class of business; ours is less than 10 per cent.

A correspondent suggests that it would be of interest to our readers if an interchange of expression could be had as to the business practice in dealing with problems such as are contained in the fifth and

sixth questions. On this point our correspondent says:

It is essential for every merchant to know just when he has got beyond a safe limit in expenses; and also to know when he must curtail his extension of credit or sink. However disagreeable it may be to a merchant to get at the true condition of his business, when he thinks that perhaps he is running behind, it is just the time a rigid examination should be made, to prevent further loss. It is well to sail close to the wind at all times, but especially so when it blows hard.

## John H. Graham & Co.

A NEW CATALOGUE is about being issued by John H. Graham & Co., 113 Chambers street, New York, relating to the goods of the many manufacturers represented by them. The catalogue is a volume of nearly 400 pages, and is excellently printed and fully illustrated. In its arrangement the goods of each manufacturer for whom they are agents are shown together, beginning with Henry Disston & Sons and closing with Kinsley & Frisbie. The volume has a double index, one relating to the manufacturers represented and the other to the different goods, alphabetically arranged. The extent and variety of the lines covered is indicated in the fact that they embrace the goods made by the following manufacturers, many of whom, it will be observed, occupy a prominent position in the trade:

American Machine Co.	Lane Bros.
American Screw Co.	P. Lowentraub.
C. H. Amidon.	W. J. Lockwood.
Auburn Tool Co.	Loring & Parks.
Atlas Tack Corporation.	McKinney Mfg. Co.
Barton Bell Co.	Jos. Mallinson.
C. S. Bell & Co.	Fred. J. Meyers Mfg. Co.
A. W. Brinkerhoff & Son.	New Departure Bell Co.
D. H. Burrell & Co.	Pike Mfg. Co.
D. W. Bosley Co.	Phoenix Caster Co.
Carter & Co.	Queen Anne Screen Co.
Chadborn & Coldwell Mfg. Co.	T. C. Richards Hardware Co.
Coes Wrench Co.	Ripley Mfg. Co.
Chantrell Tool Co.	Romer & Co.
Chalfant Mfg. Co.	Standard Flint Paper Co.
H. Disston & Sons.	Snell Mfg. Co.
Derby Plane Co.	Seymour Smith & Son.
Derby & Ball.	Storm Mfg. Co.
Double Pointed Tack Co.	Slaymaker, Barry & Co.
Geo. M. Eddy & Co.	Tiley, Pratt & Dickinson.
Farnsworth & Co.	Tucker & Dorsey Mfg. Co.
Gay & Parsons.	United States Cord Co.
Gibbs Mfg. Co.	Vulcan Hardware Co.
Hartford Hammer Co.	L. S. Watson Mfg. Co.
E. S. Hotchkiss.	Watertown Thermometer Co.
W. H. Howell Co.	
Iron City Tool Works.	
H. B. Ives & Co.	
Kinsley & Frisbie.	

Among these manufacturers it will be observed that there are several whose agency has been secured within a comparatively recent time by John H. Graham & Co., and whose goods were not represented in their former catalogue, such as Carter & Co., Axes; Derby Plane Company, Iron Planes; Kinsley & Frisbie, Door Stops; McKinney Mfg. Company, Wrought Butts and Hinges, and Slaymaker, Barry & Co., Padlocks. Some new goods are also shown, among which are a line of Curry Combs about to be put on the market by E. S. Hotchkiss, orders for which for delivery after October 15 are now being taken. A new line of Corkscrews, made by Tiley, Pratt & Dickinson, is also represented. The exceptionally complete line of goods made by Atlas

Tack Corporation is conveniently shown in a carefully arranged list, in which all requisite clearness is secured with noticeable economy of space. The volume is a credit to the house, and bears evidence of the skill and care with which it has been compiled.

## Exports.

PER BARK UNITY, SEPTEMBER 2, 1891, FOR PORT NATAL, SOUTH AFRICA.

By Corner Bros. & Co.—1 case Auger Drills, 1 case Saws.

By H. W. Peabody & Co.—10 cases Lanterns, 1 case Scales, 12 cases Cultivators, 2 cases Nails, 18 cases Picks.

By W. H. Crossman & Bro.—5 cases Hardware, 6 kegs Nails, 3 cases Plow Parts, 2 crates Stoves, 10 Washing Machines, 40 dozen Hardware, 2 cases Hardware, 5 cases Hardware, 149 cases Agricultural Implements, 300 reels Wire.

By Coombs, Crosby & Eddy.—2 cases Wringers, 2 cases Plows, 1 bundle Handles for Plows.

PER SHIP ENNERDALE, SEPTEMBER 3, 1891, FOR SYDNEY, N. S. W.

By W. H. Crossman & Bro.—1 dozen Corn Mills, 3 dozen Tills, 9 cases Scales, 15 cases Iron Bolts, 55 cases Hardware, 68 boxes Axes.

By Edward Miller & Co.—202 packages Lamp Goods.

By R. W. Forbes & Son.—1 box Hardware.

By V. Basanta —2 cases Saws.

By Atlas Tack Corporation.—38 boxes Nails, 40 boxes Shoe Nails, 12 boxes Nails, 10 boxes Iron Tacks, 12 boxes Nails.

By Fairpoint Mfg. Company.—3 packages Silver Plated Ware.

By Simpson, Hall, Miller & Co.—5 cases Plated Ware.

By Edward Miller & Co.—20 packages Lamp Goods.

By Collins & Co.—210 dozen Handled Axes.

By H. W. Peabody & Co.—153 pounds Tacks, 5 cases Hardware, 1 case Curriers' Tools, 3 cases Hames.

By Australasian-American Shipping Company.—8 cases Axes and Hatchets, 2 cases Metallic Cartridges, 3 cases Iron Wrenches.

By Coombs, Crosby & Eddy.—5 cases Lamps, 1 case Lamp Goods, 3 racks Churns, 1 case Hardware, 5 packages Axes, 2 cases Boring Machines, 2 cases Egg Beaters, 1 case Mouse Traps, 1 case Hinges, 19 dozen Sad Irons, 14 crates Refrigerators, 1 barrel Braces.

By Strong & Trowbridge.—1 case Hardware.

By Arkell & Douglas.—535 reels Wire, 15 dozen Wringers, 60 stoves, 9 racks Churns, 4 cases Scales, 9 cases Miners, 5 cases Metal Polish, 80 dozen Tools, 10 cases Bolts, 9 packages Lampware.

By S. Hoffnung & Co.—75 dozen Axes, 40 dozen Shovels and Spades, 30 dozen Hammers, 2 cases Hose, 18 boxes Scales, 1 case Bells, 1 case Lamps, 5 boxes Lamp Goods, 6 boxes Bolts, 6 boxes Wrenches, 4 cases Locks, 2 cases Traps, 1 barrel Cow Bells, 102 gross Lamp Goods, 42 dozen Cow Bells, 17 packages Hardware, 12 dozen Clamps, 1 case Guns, 1 case Bicycles, 340 dozen Tools.

PER BRIG MARY FULLS, SEPTEMBER 4, 1891, FOR PORT NATAL, SOUTH AFRICA.

By Arkell & Douglas.—440 reels Barb Wire, 56 packages Stoves, 6 cases Washers, 251 cases Plows and Paris, 30 cases Shellers, 18 cases Tools, 2 cases Ladders, 1 dozen Pumps, 1 case Curry Combs, 72 Wheelbarrows.

## Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

A more uninteresting market than that for Paints and Colors at the present time would be extremely difficult to imagine. In the way of outside influences absolutely nothing that would tend to disturb either buyer or seller has come to the surface, and, for lack of incentive to pursuing any other course, business has been conducted on strictly conservative lines. To all accounts the general distribution has been quite up to the average for the season, and the outlook for the more staple lines of goods appears to be encouraging, but there is nothing in the way of speculative

tendency or disposition to carry heavier stocks than may be needed to tide over imperative wants.

**White Lead.**—The distribution of both pure pigment and cheaper varieties by jobbers has been on a slightly more liberal scale than during the previous week, and manufacturers also note some increase in their sales. The aggregate movement, however, is merely in line with what is customary at this season, and reflects nothing out of the common in the spread of Paint in this region and immediate vicinity. Prices for all varieties are steady and unchanged.

**Zinc.**—There has been no change whatever in the market for this commodity. Some domestic manufacturers remark that orders are coming in rather slowly, and while others state that business is all that reasonably could be expected, the bulk of testimony goes to show that there is room for improvement. However, no concessions on price are made, and it is patent that whether accumulations are taking place or not the surplus is by no means burdensome. Foreign brands, like the domestic, are momentarily quiet, but steadily held at the former range of prices.

**Colors.**—Dry Colors adapted for house-painters' use are selling fairly and the movement in grinders' specialties is of about the usual volume for the season; but aside from the routine distribution there is little going on and the market presents no new feature. Prices are quite steady throughout, in the absence of any important developments in the markets for base materials.

**Miscellaneous.**—The situation of the market for Block Chalk is unchanged and market value stands about the same as it was a week ago. Practically the same may be remarked of Whiting and Paris White, with the addition that sales are fairly large. Barytes and Clays generally are rather slow at old figures.

## Oils and Turpentine.

For the general line of Animal and Vegetable Oils prices have ruled remarkably steady throughout the week. General conditions have favored the conservative element and dampened the ardor of those in the trade who are best pleased with quick terms or speculative interest. As natural under such circumstances, buyers' operations have been conducted in a cautious manner, and the record for the week is chiefly routine business with the steadiness of values. At present there are no indications of any immediate radical changes.

**Linseed Oil.**—Competition from out-of-town crushers has been very temperate, and, whatever may be in store for the future, the present situation is undoubtedly free from cause for apprehension. In any event, no pressure to sell is manifested in any quarter. For Western and other outside brands 40¢ is generally quoted. That price, however, applies chiefly to lots of a few barrels. Carloads could be secured at 39¢, if, indeed, not at a little less. City crushers hold to 42¢ for domestic and 56¢ for Calcutta Seed product, and report a good average trade in the former.

**Cotton Seed Oils.**—Additional contracts have been made for new crude at 30¢ for late October delivery, and offers of 35¢ for new Summer Yellow, November delivery, are reported, all of which would indicate a fairly firm market. Spot stock has been moving off in a sluggish manner, however, and is dull at the present time. Strictly prime quality Oil, being in moderate supply, is firm at old prices, but "off" grades, of which there seems to be more than enough to go around, sell at variable rates. Present prospects indicate a large production the coming season, with more from independent mills.

**Lard Oil.**—High cost of raw material still serves to keep prices stiff, but buyers move very cautiously, and purchases in excess of imperative wants are seldom made, except when some inducement in the shape of a special price is made. Quotations range from 55¢ for prime Western up to 57¢ for best city brands.

**Fish Oils.**—The Menhaden situation is unchanged. The fishing is represented as still being rather poor, and not enough Oil is offered from outside sources to interfere a great deal with the plans of the combine. Prices are therefore held firmly. The manufactured are selling fairly at old figures. Business has been done in crude Sperm Oil at 67½¢, Northern Whale at 50¢ and Southern Whale at 40¢. Those prices are about on a level with those that have ruled latterly for manufactured products, and the market for the latter is therefore unchanged.

**Spirits Turpentine.**—In this market there has been nothing more than an ordinary trade, and the Southern movement, while fairly good, makes little impression upon stocks at shipping ports. Prices have undergone a further advance, however, moving up to 38½¢ for regular and 38¾¢ for machine barrels.

## Pig Iron Freights.

A new pig iron division tariff went into effect September 7 on the Louisville and Nashville Railroad, as follows, per ton of 2268 pounds, when in carloads of not less than 17½ tons.

To	From			
	Chattanooga, Tenn.	Talladega, Shelby, Ironaton, Anniston, Ala.; Etowah, Cedartown, Rome, Ga.; Birmingham, Ensley, Thomas, Bessemer, Trussville, Gadsden, Attalla and Round Mountain, Ala.	Sheffield, Florence, Decatur, Ala., and Rockdale, Tenn.	Nashville, Tenn.
Akron, Ohio.....	\$2.25	\$2.75	\$2.50	\$2.20
Atchison, Kan.....	5.00	5.00	4.55	4.50
Chicago, Ill.....	3.75	4.00	3.75	3.00
Cincinnati, Ohio.....	2.25	2.75	2.50	2.20
Cleveland, Ohio.....	3.50	4.00	3.75	3.00
Columbus, Ohio.....	3.00	3.50	3.25	2.50
Denver, Col.....	8.53	8.53	8.08	8.53
Des Moines, Iowa.....	5.50	5.75	5.30	5.00
Detroit, Mich.....	3.75	4.00	3.75	3.00
East St. Louis, Ill.....	3.00	3.25	2.80	2.50
Erie, Pa.....	4.25	4.75	4.50	4.05
Findlay, Ohio.....	3.60	4.10	3.85	3.30
Hubbard, Ohio.....	3.95	4.45	4.20	3.70
Indianapolis, Ind.....	3.00	3.25	3.00	2.25
Ironton, Ohio.....	2.98	3.46	3.21	2.29
Kansas City, Mo.....	5.00	5.00	4.55	4.50
Little Rock, Ark.....	3.50	3.50	.....	.....
Martin's Ferry, Ohio.....	3.90	4.40	4.15	4.05
McKeesport, Pa.....	3.90	4.40	4.15	4.20
Memphis, Tenn.....	2.00	2.00	2.00	2.15
Milwaukee, Wis.....	4.15	4.40	4.15	3.40
Minneapolis, Minn.....	5.50	5.75	5.50	5.00
Omaha, Neb.....	5.84	5.84	5.39	5.34
Pittsburgh, Pa.....	3.90	4.40	4.15	3.40
Rochester, N. Y.....	4.75	5.25	5.00	4.70
Springfield, Ohio.....	3.00	3.50	3.25	2.50
Springfield, Ill.....	3.75	4.00	3.75	3.45
St. Joseph, Mo.....	5.00	5.00	4.55	4.50
St. Paul, Minn.....	5.50	5.75	5.50	5.00
Terre Haute, Ind.....	3.00	3.25	3.00	2.25
Toledo, Ohio.....	3.50	4.00	3.75	3.00
Topeka, Kan.....	6.59	6.59	6.14	6.09
Troy, N. Y.....	5.75	6.25	6.00	5.70
Wheeling, W. Va.....	3.90	4.40	4.15	3.40
Youngstown, Ohio.....	3.60	4.10	3.85	3.70
Zanesville, Ohio.....	3.50	4.00	3.75	3.00

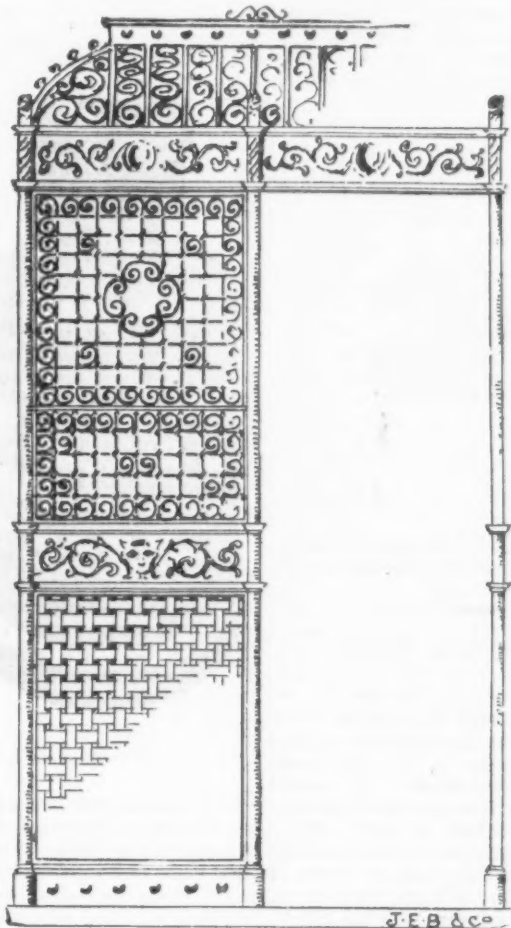
The Chattanooga Foundry and Pipe Works, at Chattanooga, Tenn., have completed a branch pipe works, with a capacity of 100 tons per day, at Bridgeport, Alabama.



**Elevator Car.**

J. E. Bolles & Co., Detroit, Mich., are showing various designs of iron work for buildings, of which they make a specialty. The accompanying illustration represents an elevator car which has recently been

sired. The tool being light with creased head is referred to as making it also an excellent lathing hatchet and all around handy tool in addition to its adaptability to the special work for which it is designed. The point is made that using it in shingling all trouble in striking lines



Elevator Car.

made by them. The lightness of design carries with it requisite strength and is pleasing in effect. The car is made in wrought iron, dead black or electro bronze finish. It can also be made in brass, polished or antique finish.

**The Shingler.**

The accompanying illustration represents a new tool which is manufactured by Buffalo Hammer Company, Buffalo, N. Y. It will be observed that this tool has a gauge by which shingles can be properly

which may not show in wet or frosty weather is avoided, and it is stated that a man can work four to five rows without changing his position. It is also mentioned that those using it are able to lay many more shingles in a stated time than with the old method. The weight of the shingler without handle is 1 pound.

"Not until recently," says B. J. White of Nebraska to a New York reporter, "did I realize how painfully true are the stories regarding the decadence of the once proud American shipping interests. I desired to



The Shingler.

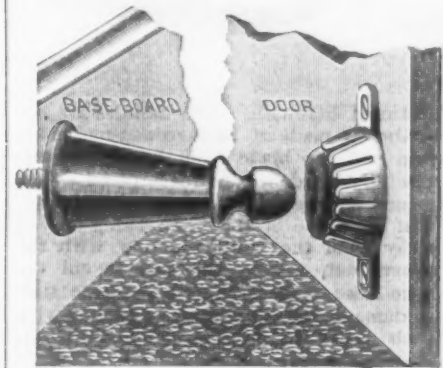
placed without the use of a line. It is made in two sizes, Nos. 01 and 02, the former having a gauge  $4\frac{1}{2}$  and 5 inches, and the latter a gauge 5 and  $5\frac{1}{2}$  inches. Either of these gauges can obviously be used as de-

charter a vessel of not less than 3000 tons burden to go around Cape Horn, and visited one of the largest firms in this city for that purpose. They told me that there were just two ships of that size sailing the

American flag, and one of them had been reported aground in Brazil, while the other was off the Pacific Coast somewhere. I could get plenty of foreign vessels, but under the law I would not be allowed to charter them for a cruise from one American port to another. In consequence it will be necessary for me to get three vessels of 1000 tons each, instead of one of 3000, as I had contemplated."

**Eureka Combined Door Stop and Hold Back.**

Kinsley & Frisbie, Bridgeport, Conn., for whom John H. Graham & Co. are agents, 113 Chambers street, New York, are putting this article on the market, illustrations of it being given in Figs. 1 and 2. The device is adapted to doors of any size, and is easily applied, the knob being screwed into the base board, wall or floor, and the rosette attached to the door with two screws as shown, the wood work being thus uninjured. The rubber bumper and



Eureka Combined Door Stop and Hold Back.—Fig. 1.—Wall Attachment.

hold back are held securely in the rosette by reason of its cone shape. In swinging back the door the rubber acts as a bumper in striking the knob, and by a slight pressure against the door the acorn tip of the knob is pressed into the rubber ring and the door is held securely back, its release being effected by a gentle pull. The simplicity, cheapness, durability and ornamental appearance of this article are referred to by the manufacturers. The

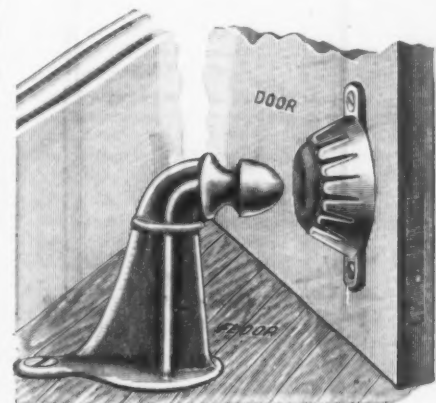


Fig. 2.—Floor Attachment.

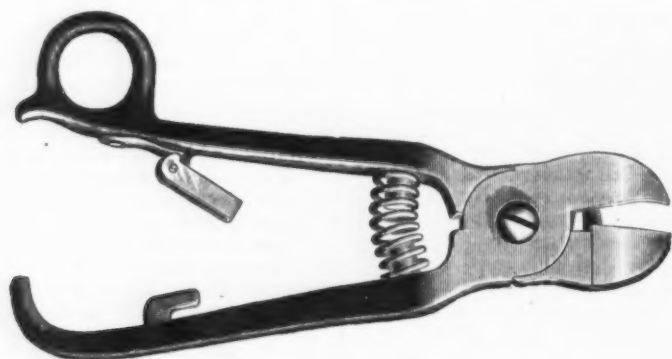
goods are made in iron, nickel plated and japanned in colors, and in finished brass, lacquered.

It has been figured out that the number of tourists who went abroad this year was 110,000, and that the aggregate sum expended by them was \$62,500,000, distributed as follows: Fares, \$13,111,000; traveling expenses abroad, \$38,500,000; purchases, \$11,000,000. Such figures are, of

course, very rough estimates indeed, but there is little question that the sum expended by American travelers in Europe is far greater than the cash which emigrants annually bring to the United States.

#### Orange Shear.

Seymour Smith & Son, Oakville, Conn., are putting on the market a shear especially designed for picking oranges, as il-



Orange Shear.

lustrated herewith. The handles are described as made of best refined malleable iron and the blade from best cast steel, carefully hardened and tempered. The manufacturers call attention to the fact that the shape of the jaws, being curved away from the point, together with the square cut, enable the user to cut the stem close to the orange, leaving no stub to damage oranges coming in contact with each other in packing and shipping, thereby, it is pointed out, avoiding a trouble which has been the source of much loss to growers and shippers. These shears are made with parts interchangeable, are well and durably constructed, and the efficiency with which they perform their work is emphasized by the manufacturers.

#### Fox's Barb-Wire Post.

J. E. Bolles & Co., Detroit, Mich., are introducing a post for barb wire, as illustrated herewith, of which they are ex-

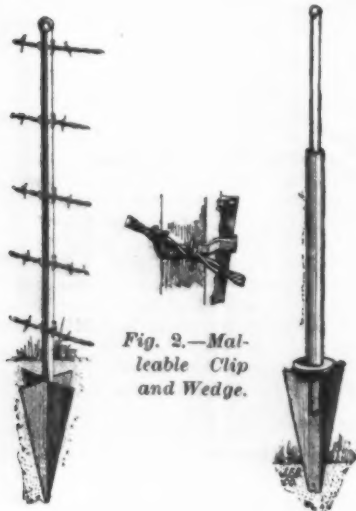


Fig. 1.—Fox's Barb Wire Post.

Fig. 3.—Method of Driving Barb Wire Post.

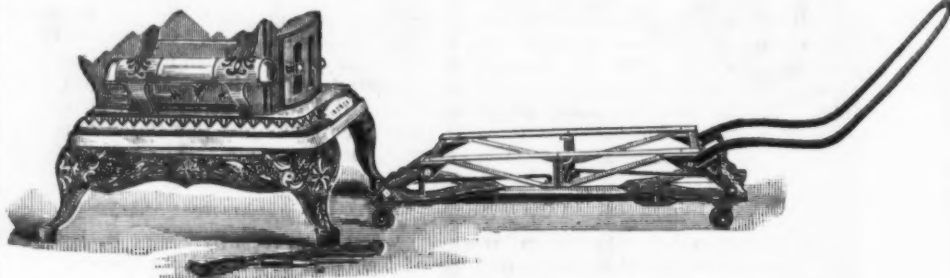
clusive manufacturers. The post is made of a single bar of 1-inch angle iron, the edges being brought together along their entire length by doubling the bar midway between its two ends, thus making a square tube, the bend forming the top of the post. This tube is then secured to a

four-flanged pointed base, as in Fig. 1. The wire is attached to the post by means of an adjustable malleable clip, which is held in place by a wedge, as shown in Fig. 2. To drive the post into the ground, a piece of pipe large enough to pass over the clips is slipped down on to the pointed flange, the blows from the maul falling upon the top of the pipe. The manufacturers claim that the post is strong; that frost will not effect it; that the united strength of two strong men cannot pull it

from the ground, and that when the wedge is driven the clip and wire are held rigidly in position.

#### The Home Stove Truck.

In the accompanying illustration we present a general view of a stove truck which has just been brought out by Randall & Ward of Leroy, N. Y. It is made under the name of the Home, and consists of two halves of a frame jointed together by a single piece, which is made fast to one-half of the frame and slips through the other half. Above this frame is a truss or supplementary frame, as it may be termed, pivoted at each end with jointed knees. In the center of the truss is a cross bar, on which is pivoted a short lever, jointed to which are two rods running in opposite



The Home Stove Truck.

directions and to each end of the lower frame. The lever is attached to the knees at one end, and is used for the purpose of making them stand erect or at an angle, as the case may be. One of the rods carries the power from half of the lower frame, while the other locks the frame firmly in an elevated position. The arm, or reach, as it is called, passes over half of the lower frame when the stove is elevated, and may be fastened there, thus preventing the stove from dropping back to the floor. The manufacturers refer to the fact that it requires but a moment to place this truck under a stove, press the lever down with the hand or foot and the work is done. The truck is mounted on anti-friction casters, and is claimed to carry a stove of any weight.

A special train on the New York Central made the run from New York to Buffalo, 436 miles, in 440 minutes, including stops which aggregated 14 minutes.

#### English Black Enamel.

The Nubian Iron Enamel Company, Cragin, Ill., are putting on the market the preparation illustrated herewith, which is a cheaper grade of grate enamel than Bon-



English Black Enamel.

nell's Nubian iron enamel, which has been on the market for many years and is so well known to the trade. The company state that since these goods became so popular many cheap imitations have been offered, the only merit of which is the low price at which they can be obtained. For the protection of their customers, the company have concluded, therefore, to put up the

cheaper quality illustrated, which they refer to as fully worth the money asked for it. They state that it is not as good as Nubian, but is superior to the average cheap enamel, while it is sold as cheap as any. A handsome display stand is packed in each 2 dozen case.

#### Sheet-Metal Magazine.

The Garry Iron and Steel Roofing Company, 152 Merwin street, Cleveland, Ohio, are manufacturing a sheet-metal magazine, a general view of which is shown in the accompanying illustration. The magazine is made of one and one-half angle iron and covered with No. 20 iron. It is then painted and provided with a hasp for padlock, as is clearly indicated in the cut. Holes are drilled in the angle iron, so that the device can be bolted to a stone or wood floor if so desired. It is made in sections and so marked that any person can readily



take it apart or put it together. It is referred to as being cheap and practical and specially intended for storing combustible and explosive material, such as dynamite, gasoline, powder, coal oil, &c. It is made in four sizes, No. 1 being 4 feet wide, 4 feet high and 6 feet long, and having a



Sheet-Metal Magazine.

capacity of 150 kegs, while No. 4 is 7 feet wide, 7 feet high and 9 feet long and has a capacity of 800 kegs.

Nubian Iron Enamel Company, Cragin, Ill., advise us that their trade for 1891 is over 40 per cent. in excess of that for 1890, and that the volume of their present business is ten times that of 1884, when Charles E. Bonnell, the efficient and enterprising secretary of the company, assumed its active management. Nubian has been manufactured for 18 years and the company's goods are marketed in every State and Territory of the United States, while the export demand is considerable. Their business is not confined to the small package goods which are sold to the hard-

### The Flexible Light Holder.

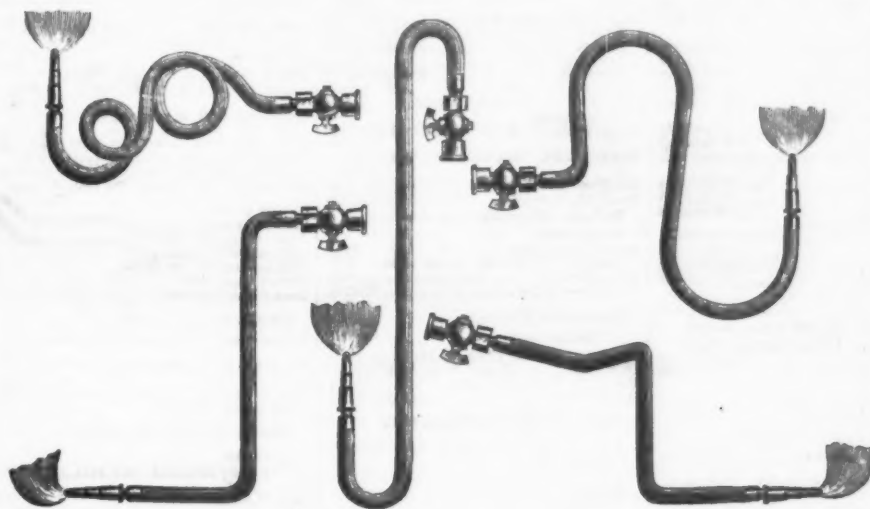
A form of flexible gas bracket, or light holder, as it is called, is being manufactured and sold by L. L. Lord, 936 Market street, Meadville, Pa. This device, which is of interest to the gas-fitting trade, is intended especially for use in factories, machine shops, offices and houses, in any place where a light is needed and where it is desirable to change the position of the flame. The holder can be easily adjusted to any position, and will hold the light just where it is needed. These features, it is pointed out, recommend it to all who appreciate the amount of time and gas wasted by workmen adjusting the jointed bracket. The holder, furthermore, it is claimed, will outwear the ordinary form of bracket. The standard size is 24 inches, and the material is such that the tube can be bent in all the shapes shown in the illustration, besides any other possible form that may be desired. Furthermore, there is no spring to the tube, but it stays in whatever position put without any tendency to return to its former shape. Altogether it is a very interesting device and will be appreciated by the trade generally. These holders can be furnished in any length to order by the manufacturer.

### PERSONAL.

C. Hershheim, the New York importer of spiegeleisen and ferromanganese, has returned from Europe.

James C. Bayles, president of the Spial Weld Tube Company, will soon go abroad.

P. R. Baker, formerly assistant manager of the plant of the Apollo Iron and Steel Company, at Apollo, Pa., has assumed charge of the Cambridge Iron and Steel Company of Cambridge, Ohio, as general



The Flexible Light Holder in Various Positions.

ware and general store trade, but covers the entire field of blacks suitable for iron work, ranging from the cheapest boiler paint to the high grades of bicycle, electric and railway blacks. Among the railway systems supplied by the manufacturers of these goods are the Pennsylvania and the Chicago and Northwestern. The company have found it necessary to move four times in six years to meet the growth of their business. Last year they purchased the present factory site, 105 x 269, with side tracks and all facilities for the rapid and economical receipt and shipment of goods. The main building is 50 x 250, two stories high, there being also boiler house, melting rooms and storage warehouses.

manager. For some time past Mr. Baker has been connected with Wilkins & Davidson, civil engineers, of Pittsburgh. A number of extensive improvements and additions are being made at the present time to the plant of the Cambridge Iron and Steel Company.

George G. McMurtry of Pittsburgh has returned from a long trip in Europe.

J. T. Smith, chairman of the Otis Steel Company, Cleveland, Ohio, has arrived from England during the week.

W. L. Abbott, chairman of Carnegie, Phipps & Co., Limited, Pittsburgh, Pa., sailed for Europe on Saturday, the 12th inst. Mr. Abbott goes on a pleasure trip

only for the purpose of securing rest, and will be absent until about December 1.

J. M. Clark of the well-known firm of Naylor & Co. is expected to arrive on the Normannia.

Ground has at last been broken at Roseville, a suburb of San Diego, Cal., for the large iron works of the San Diego Iron and Steel Company, of which Dr. Eames of Pittsburgh is the projector. Papers of incorporation have been filed, and Dr. Eames elected president, J. F. Neeley vice president and Warren Wilson treasurer and secretary. The capital stock is \$1,000,000.

At the meeting of the Board of City Trusts of Philadelphia, it was resolved, in accordance with the recommendations of the Franklin Institute, to award the John Scott medal and premium to Albert E. Pentz of Elizabeth, N. J., for his improvement in boring and milling machine, and to John G. Spiedel of Reading for his improvement in portable hoists.

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# CURRENT HARDWARE PRICES.

SEPTEMBER 16, 1891.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' Prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Adjusters, Blind.

Domestic. . . . . \$ dos \$3.00, 33¢  
Excessor. . . . . \$ dos \$10.00, 50¢  
Washburn's Self-Locking. . . . . 20¢

Ammunition.—See Caps, Cartridges, Shells, &c.

## Anvils.—

Eagle Anvil, \$ 10¢. . . . . 15¢  
Peter Wright's. . . . . 11¢  
Armstrong's Mouse Hole. . . . . 12¢  
Armstrong's Mouse Hole, Extra. . . . . 12¢  
Trenton. . . . . 10¢  
Wilkinson's. . . . . 10¢  
Moore & Barnes Mfg. Co. . . . . 88¢

## Anvil Vise and Drill—

Millers Falls Co., \$18.00. . . . . 20¢  
Cheney Anvil and Vise. . . . . 25¢  
Allen Anvil and Vise. . . . . 40¢  
Star. . . . . 45¢

Apple Parers.—See Parers, Apple, &c.

## Augers and Bits—

Douglas Mfg. Co. . . . . 70¢  
Wm. A. Ives & Co. . . . . 70¢  
Humphreysville Mfg. Co. . . . . 70¢  
French, Swift & Co. (F. H. Beecher, F. S. & W. Co.) . . . . . 70¢  
Rockford Bit Company. . . . . 65¢  
Cook's, Douglas Mfg. Co. . . . . 65¢  
Cook's, N. H. Copper Co. . . . . 60¢  
Ives' Circular Lip. . . . . 60¢  
Patent Solid Head. . . . . 60¢  
C. E. Jennings & Co., No. 10, extension. . . . . 40¢  
C. E. Jennings & Co., No. 30. . . . . 60¢  
C. E. Jennings & Co., Auger Bits, set. . . . . 32¢  
Lewis' Patent Single Twist. . . . . 45¢  
Russell Jennings' Augers and Bits. . . . . 25¢  
Imitation Jennings' Bits. . . . . 60¢  
Snell's Jennings' Pattern. . . . . 60¢  
Pugh's Black. . . . . 60¢  
Rockford, Jennings' Pattern. . . . . 60¢  
Car Bits. . . . . 60¢  
Car Bits, F. S. & W. Co. . . . . 60¢  
Snell's Car Bits. . . . . 60¢  
L. Hommedieu Car Bits. . . . . 15¢  
Forster's Patent Auger Bits. . . . . 30¢  
Cincinnati Bell-Rangers' Bits. . . . . 30¢

## Bit Stock Drills—

Morse Twist Drills. . . . . 60¢  
Standard. . . . . 60¢  
Cleveland. . . . . 60¢  
Syracuse, for wood (wood list). . . . . 30¢  
Syracuse, for wood (wood list). . . . . 30¢  
Williams' or Holt's, for metal. . . . . 50¢  
Williams' or Holt's, for wood. . . . . 40¢  
Cincinnati, for wood. . . . . 40¢  
Cincinnati, for metal. . . . . 45¢

## Expansive Bits—

Clark's small, \$18; large, \$30. . . . . 35¢  
Ives' No. 4, \$ dos \$80. . . . . 40¢  
Swan's. . . . . 40¢  
Stearns, No. 1, \$20; No. 2, \$25. . . . . 35¢  
Stearns' No. 2, \$48. . . . . 30¢

## Gimlet Bits—

Common. . . . . \$ gross \$2.75 @ \$3.25  
Diamond. . . . . \$ dos \$1.10. . . . . 25¢  
See. . . . . 25¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢

## Hollow Augers—

Ives. . . . . 33¢  
French, Swift & Co. . . . . 33¢  
Bonney's Adjustable, \$ dos \$48. . . . . 40¢  
Stearns'. . . . . 30¢  
Ives' Expansive, each \$4.50. . . . . 50¢  
Universal Expansive, each \$4.50. . . . . 30¢  
Wood's. . . . . 25¢  
Cincinnati Adjustable. . . . . 25¢  
Cincinnati Standard. . . . . 25¢  
Ship Augers and Bits—  
L'Hommiedieu's. . . . . 15¢  
Watrous'. . . . . 15¢  
Snell's. . . . . 15¢  
Snell's Ship Auger Pat'n Car Bits. . . . . 15¢

## Awl Hafts.—See Hafts, Awl.

Awls, Brad Nuts, &c.—  
Awls, Sewing, Common. . . . . \$ gr \$1.70, 45¢  
Awls, Should, Peg. . . . . \$ gr \$2.45, 50¢  
Awls, Pat. Peg. . . . . \$ gr 65¢, 50¢  
Awls, Shouldered Brad. . . . . \$ gr 70¢, 35¢  
Awls, Handled Brad. . . . . \$ gr 75¢, 45¢  
Awls, Handled Scratch. . . . . \$ gr 75¢, 55¢  
Awls, Socket Scratch. . . . . \$ dos \$1.50, 35¢

## Awl and Tool Sets.—See Sets, Awl and Tool.

Axes—  
First quality, best brands. . . . . \$7.00 @ \$7.50  
First qual., other brands. . . . . 6.03¢ @  
Second quality. . . . . 6.00  
Axe tirecase.—See i \*ase, Axe.

## Axles—

No. 1, 1 1/4 @ 5¢, No. 2 5/8 @ 6¢  
Nos. 7 to 14. . . . . 65¢  
Nos. 15 to 18. . . . . 47¢  
Nos. 19 to 22. . . . . 70¢  
Concord Axles, loose collar. . . . . 5¢  
Concord Axles, solid collar. . . . . 6¢  
National Tubular Self-Oiling. . . . . 33¢

## Bag Holders.—See Holders, Bag.

Balances—  
Spring Balances. . . . . 40¢  
No. 3000. . . . . 30  
Chatillon, \$ dos. . . . . \$0.30 0.95 1.75 net  
Chatillon Straight Balances. . . . . 40¢  
Chatillon Circular Balances. . . . . 50¢

## Barb Wire.—See Wire, Barb.

## Bars.

Crow.—  
Cast Steel. . . . . \$ 3¢  
Iron, Steel Points. . . . . \$ 3¢

## Basins, Wash—

Standard Fiberglass, No. 1, 10 1/2-inch. . . . . \$2;  
12-inch, \$2.25; 13 1/2-inch, \$2.75; 15-inch, \$3.25.

## Beams, Scale—

Scale Beams, List Jan. 12, '89. . . . . 50¢  
Chatillon's No. 1. . . . . 60¢  
Chatillon's No. 2. . . . . 50¢  
Custer's. . . . . 33¢

## Benches—

Dover. . . . . \$ dos \$1.50  
Duplex (Standard Co.). . . . . \$ dos \$1.25  
Rival (Standard Co.). . . . . \$ dos \$1.30  
Duplex Extra Heavy (Standard Co.). . . . . 33¢

## Benters—

Bryant's. . . . . \$ gro \$14.00  
Double (H. & R. Mfg. Co.). . . . . \$ gro. No. 0, \$12.00; No. 1, \$15.00; No. 2, \$36.00  
Easy (H. & R. Mfg. Co.). . . . . \$ gro \$12.00  
Triple (H. & R. Mfg. Co.). . . . . \$ gro \$16.50  
Spiral. . . . . \$ gro \$4.25 @ 4.50  
Improved Acme (H. & R. Mfg. Co.). . . . . \$ gro \$2.00

Paine, Diehl & Co.'s. . . . . \$ gro \$24.00  
Silver & Co. . . . . \$ dox \$5.50

## Cutlery—

Keystone, P.D.&C., Each, No. 1, \$1; No. 2, \$2. . . . . 30¢

## Cores—

Common Wrought. . . . . 60¢  
Western. . . . . 20¢  
Western, Sargent's list. . . . . 70¢  
Kentucky, "Star". . . . . 20¢  
Kentucky, Sargent's list. . . . . 70¢  
Kentucky, Durham. . . . . 70¢  
Dodge, Genuine & Kentucky. . . . . 70¢  
Texas Star. . . . . 60¢

## Doors—

Gong, Abbe's. . . . . 33¢  
Gong, Yankee. . . . . 45¢  
Gong, Eastern's. . . . . 45¢  
Crane, Taylor's. . . . . 25¢  
Crane, Taylor's. . . . . 25¢  
Crane, Taylor's. . . . . 25¢  
Crane, Taylor's. . . . . 25¢  
Crane, Taylor's. . . . . 25¢

## Electric—

Wollensak's. . . . . 30¢  
Bigelow & Dowse. . . . . 20¢  
Taylor's. . . . . 20¢

## Hand—

Light Brass. . . . . 75¢  
Extra Heavy. . . . . 65¢  
Wire Metal. . . . . 60¢  
Silver Chime. . . . . 33¢  
Globe (One's Patent). . . . . 25¢

## Miscellaneous—

Call. . . . . 40¢  
Farm Bell. . . . . 35¢  
Steel Alloy Church and School Bells. . . . . 40¢

## Blacksmiths—

Blacksmiths'. . . . . 60¢  
Blacksmiths'. . . . . 40¢  
Blacksmiths'. . . . . 40¢  
Blacksmiths'. . . . . 40¢  
Blacksmiths'. . . . . 40¢

## Belted, Rubber—

Common Standard. . . . . 70¢  
Standard. . . . . 70¢  
Extra. . . . . 60¢  
N.Y.B.&P.Co., Carbon. . . . . 30¢  
N.Y.B.&P.Co., Diamond. . . . . 50¢  
N.Y.B.&P.Co., Para. . . . . 40¢

## Bench Stops.—See Stops, Bench.

Benders and Upsetters, Tire.  
Stoddard's Lightning Tire Upsetters. . . . . 15¢  
Detroit Perfected Tire Bender. . . . . 15¢

## Bits—

Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

## Bit Holders.—See Holders.

Blind Adjusters.—See Adjusters, Blind.

Blind Fasteners.—See Fasteners, Blind.

Blind Staples.—See Staples, Blind.

## Blocks—

Ordinary Tackle, List May 20, 1889. . . . . 70¢  
Cleveland Block Co., Mal. Iron. . . . . 50¢  
Moore's Novelty, Mal. Iron. . . . . 50¢  
Sure Grip Steel Tackle Blocks. . . . . 25¢

## Boards, Stove—

Wood Lined "Crystal". . . . . 50¢  
"Oxidized". . . . . 45¢  
Embossed. . . . . 50¢  
Paper Lined Zinc. . . . . 55¢  
"Crystal". . . . . 55¢  
Embossed. . . . . 55¢  
"New Tacoma". . . . . 55¢

## Boils—

Com. List June 10, '84. . . . . 75¢  
Genuine Eagle, List Oct. '84. . . . . 75¢  
Phila. pattern, List Oct. '84. . . . . 75¢  
R.B.&W., old list. . . . . 70¢  
Machine, List Jan. 1, 1890. . . . . 75¢

Bolt Ends, List Jan. 1, 1890. . . . . 75¢  
Cast Iron Barrel, Square, &c. . . . . 70¢  
Cast Iron Shutter Bolts. . . . . 70¢  
Cast Iron Chain (Sargent's list). . . . . 65¢  
Ives' Patent Door Bolts. . . . . 60¢  
Wrought Barrel. . . . . 70¢  
Wrought Square. . . . . 70¢  
Wrt Shutter, all Iron, Stanley's. . . . . 60¢  
Wrt Shutter, Brass Knob. . . . . 40¢  
Wrt Shutter, Sargent's list. . . . . 60¢  
Wrt Sunk Flush, Sargent's list. . . . . 55¢  
Wrt Sunk Flush, Stanley's list. . . . . 50¢  
Wrt B.K. Flush, Com'n. . . . . 55¢

## Door and Shutter—

Cast Iron Barrel, Square, &c. . . . . 70¢  
Cast Iron Shutter Bolts. . . . . 70¢  
Cast Iron Chain (Sargent's list). . . . . 65¢  
Ives' Patent Door Bolts. . . . . 60¢  
Wrought Barrel. . . . . 70¢  
Wrought Square. . . . . 70¢  
Wrt Shutter, all Iron, Stanley's. . . . . 60¢  
Wrt Shutter, Brass Knob. . . . . 40¢  
Wrt Shutter, Sargent's list. . . . . 60¢  
Wrt Sunk Flush, Sargent's list. . . . . 55¢  
Wrt Sunk Flush, Stanley's list. . . . . 50¢  
Wrt B.K. Flush, Com'n. . . . . 55¢

## Drills—

Common. . . . . \$ gross \$2.75 @ \$3.25  
Diamond. . . . . \$ dos \$1.10. . . . . 25¢  
See. . . . . 25¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢

## Expansive Bits—

Clark's small, \$18; large, \$30. . . . . 35¢  
Ives' No. 4, \$ dos \$80. . . . . 40¢  
Swan's. . . . . 40¢  
Stearns, No. 1, \$20; No. 2, \$25. . . . . 35¢  
Stearns' No. 2, \$48. . . . . 30¢

## Gimlet Bits—

Common. . . . . \$ gross \$2.75 @ \$3.25  
Diamond. . . . . \$ dos \$1.10. . . . . 25¢  
See. . . . . 25¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢  
Double Cut, Hartwell's. . . . . 45¢

## Hollow Augers—

Ives. . . . . 33¢  
French, Swift & Co. . . . . 33¢  
Bonney's Adjustable, \$ dos \$48. . . . . 40¢  
Stearns'. . . . . 30¢  
Ives' Expansive, each \$4.50. . . . . 50¢  
Universal Expansive, each \$4.50. . . . . 30¢  
Wood's. . . . . 25¢  
Cincinnati Adjustable. . . . . 25¢  
Cincinnati Standard. . . . . 25¢

## Ship Augers and Bits—

L'Hommiedieu's. . . . . 15¢  
Watrous'. . . . . 15¢  
Snell's. . . . . 15¢  
Snell's Ship Auger Pat'n Car Bits. . . . . 15¢

## Awl Hafts.—See Hafts, Awl.

Awls, Brad Nuts, &c.—  
Awls, Sewing, Common. . . . . \$ gr \$1.70, 45¢  
Awls, Should, Peg. . . . . \$ gr \$2.45, 50¢  
Awls, Pat. Peg. . . . . \$ gr 65¢, 50¢  
Awls, Shouldered Brad. . . . . \$ gr 70¢, 35¢  
Awls, Handled Brad. . . . . \$ gr 75¢, 45¢  
Awls, Handled Scratch. . . . . \$ gr 75¢, 55¢  
Awls, Socket Scratch. . . . . \$ dos \$1.50, 35¢

## Awl and Tool Sets.—See Sets, Awl and Tool.

Axes—  
First quality, best brands. . . . . \$7.00 @ \$7.50  
First qual., other brands. . . . . 6.03¢ @  
Second quality. . . . . 6.00  
Axe tirecase.—See i \*ase, Axe.

## Axles—

No. 1, 1 1/4 @ 5¢, No. 2 5/8 @ 6¢  
Nos. 7 to 14. . . . . 65¢  
Nos. 15 to 18. . . . . 47¢  
Nos. 19 to 22. . . . . 70¢  
Concord Axles, loose collar. . . . . 5¢  
Concord Axles, solid collar. . . . . 6¢  
National Tubular Self-Oiling. . . . . 33¢

## Bag Holders.—See Holders, Bag.

Balances—  
Spring Balances. . . . . 40¢  
No. 3000. . . . . 30  
Chatillon, \$ dos. . . . . \$0.30 0.95 1.75 net  
Chatillon Straight Balances. . . . . 40¢  
Chatillon Circular Balances. . . . . 50¢

## Stove and Plow—

Stove. . . . . 60¢  
Plow. . . . . 60¢  
R. B. & W., Plow. . . . . 65¢

## Tire—

Common, List Feb. 28, '83. . . . . 65¢  
Port Chester Bolt and Nut Company.  
Empire, List Feb. 28, '83. . . . . 65¢  
Keystone, Philadel. . . . . 80¢  
Norway, Phila. . . . . 75¢

## American Screw Company—

Norway, Phila. . . . . 75¢  
Eagle, Phila. . . . . 80¢  
Philadel. . . . . 80¢  
Bay State, List Feb. 28, '83. . . . . 65¢  
R.B.&W., Philadel. . . . . 60¢

## Borers, Tap.

Common and Hand. . . . . 30¢  
Ives' Tap Borers. . . . . 33¢  
Enterprise Mfg. Co. . . . . 30¢  
Clark's. . . . . 33¢

## Borax.

Boring Machines.—See Machines, Boring.

## Bow Pins.—See Pins, Bow.

## Boxes, Wagon.

Per B. . . . . 2¢

## Braces—

American Bit Brace Co.:  
Nos. 10, 12, 20. . . . . 60¢  
Nos. 11, 21, 24, 27. . . . . 70¢  
Nos. 22, 23, 25. . . . . 60¢  
Nos. 13, 26, 30, 37. . . . . 70¢  
Ball Races, net. . . . . \$1.12 to \$1.25

## Amidon—

Barker's Imp'd Plain. . . . . 75¢  
Barker's Imp. Nickle. . . . . 65¢  
Ratchet. . . . . 75¢  
Eclipse Ratchet. . . . . 60¢  
Globe Jawed. . . . . 40¢  
Corner Brace. . . . . 40¢  
Universal, 8 in., \$3.10 10 in. . . . . \$4.25  
Buffalo Ball. . . . . \$1.10 @ \$1.15

## Barber's.

Nos. 10 to 16. . . . . 60¢  
Nos. 30 to 33. . . . . 50¢  
Nos. 40 to 63. . . . . 60¢

## Saxton's.

Barker's Imp. Polished. . . . . 75¢  
Barker's Imp. Nickle. . . . . 65¢  
Ratchet. . . . . 75¢  
Eclipse Ratchet. . . . . 60¢  
Globe Jawed. . . . . 40¢  
Corner Brace. . . . . 40¢  
Universal, 8 in., \$3.10 10 in. . . . . \$4.25  
Buffalo Ball. . . . . \$1.10 @ \$1.15

## Bartholomew's.

Nos. 25, 27 and 30. . . . . 50¢  
Nos. 117, 118, 119. . . . . 70¢  
Sporford Ball, American. . . . . \$1.00 @ \$1.10  
Fray's Genuine Spoford's. . . . . 60¢  
Fray's No. 70 to 120, 81 to 123, 207 to 414. . . . . 50¢

## Ives' New Haven Novelty.

New Haven Ratchet. . . . . 60¢  
Barber Ratchet. . . . . 60¢  
Barbers. . . . . 60¢  
Sporford Ball, American. . . . . \$1.00 @ \$1.10  
Osgood's Ratchet. . . . . 40¢  
P. S. & W. Co., Peck's Patent. . . . . 60¢

## Brackets—

Shelf plain, Sargent list. . . . . 55¢  
Shelf, fancy, Sargent's list. . . . . 60¢  
Reading, plain. . . . . 50¢  
Reading, Rosette. . . . . 60¢

## Bright Wire Goods.—See Wire.

## Broilers—

Best. . . . . 9 10 9 11  
Basting. . . . . \$4.50 5.50 6.50  
New Haven. . . . . 50¢  
Wire Goods Co. . . . . 65¢

## Buckets, Well.

Galvanized.—  
Hill's. . . . . \$ dos 12 qt. \$4.25; 14 qt. \$5.2  
Iron Clad. . . . . \$ dos 14 qt. \$4.25 @ \$4.5  
Helwig's Flat Iron Band. . . . . \$3.71  
Helwig's Wired Top. . . . . \$ dos \$4.00

## Bull Rings.—See Rings, Bull.

Butchers' Cleavers.—See Cleavers, Butchers'.

## Butte—

Brass. . . . . 75¢  
Wrought Brass. . . . . 75¢  
Cast Brass, Corbin's, Fast. . . . . 33¢  
Cast Brass, Loose Joint. . . . . 33¢

## Cast Iron—

Fast Joint, Narrow. . . . . 60¢  
Fast Joint, Broad. . . . . 60¢  
Loose Joint. . . . . 60¢  
Loose Joint, Japanned. . . . . 60¢  
Loose Joint, Jap. with Acorns. . . . . 70¢  
Mayer's Hinges. . . . . 70¢  
Loose Pin, Acorns, Japanned. . . . . 70¢  
Loose Pin, Acorns, Japanned. . . . . 70¢

## Wrought Steel—

Fast Joint, Narrow. . . . . 60¢  
Fast Joint, Broad. . . . . 60¢  
Table Butts, Back Flaps, &c. . . . . 70¢  
Inside Blind, Regular. . . . . 70¢  
Inside Blind, Light. . . . . 70¢  
Loose Pin. . . . . 70¢  
Bronzed Wrought Butts. . . . . 80¢

## Calipers.—See Compasses.



**Clamps—**

R. I. Tool Co.'s Wrought Iron.....25¢  
Adjustable, Cincinnati.....15¢10¢  
Adjustable, Hammers.....15¢  
Adjustable, Stearns.....30¢30¢10¢  
Stearns' Adjustable Cabinet and Corner.....30¢30¢10¢  
Cabinet, Sargent's.....60¢10¢  
Carriage Makers', Sargent's.....70¢10¢  
Carriage Makers', P. S. & W. Co., 404-105  
Eberhard Mfg. Co.....40¢50¢40¢10¢  
Parallel, C. H. Besly & Co.....25¢  
Warner's.....40¢10¢40¢10¢25¢  
Saw Clamps, see Vises, Saw Filers.  
Carpenters', Cincinnati.....25¢10¢

**Cleavers.**

**Butchers'.**  
Bradley's.....25¢30¢  
L. & J. J. White.....20¢5¢  
Beatty's.....40¢40¢5¢  
New Haven Edge Tool Co.'s.....40¢  
P. S. & W.....33¢25¢33¢10¢  
Foster Bros.....30¢  
Schulte, Lohoff & Co.....40¢40¢5¢

**Clips—**

Norway Axle, 1/4 & 5-16.....55¢55¢  
And grade Norway Axle, 1/4 & 5-16 65¢55¢  
Superior Axle Clips.....60¢55¢70¢  
Norway Spring Bar Clips, 5-16.....60¢55¢  
Wrought-Iron Felloe Clips.....5¢  
Steel Felloe Clips.....5¢  
Baker Axle Clips.....25¢

**Cloth and Netting, Wire—See Wire, &c.**

**Cockeyes.....50¢**

**Cocks, Brass.....50¢25¢**

**Coffee Mills—See Mills, Coffee.**

**Collars, Dog, &c.**

Medford Fancy Goods Co.....40¢10¢  
Embossed, Gift, Pope & Steven's List.....30¢10¢  
Leather, Pope & Steven's List.....40¢  
Brass, Pope & Steven's List.....40¢  
Chapman Mfg. Company.....50¢10¢60¢

**Combs, Curry.**

Fitch's.....50¢10¢50¢10¢10¢  
Rubber, per doz \$10.00.....20¢  
Perfect.....50¢  
Kellogg's.....50¢10¢  
Sweet & Clark's.....50¢10¢

**Compasses, Dividers, &c.—**

Compasses, Callipers, Dividers, 70¢70¢10¢  
Bemis & Call Co.'s.....60¢5¢  
Dividers.....60¢5¢  
Compasses & Callipers.....60¢5¢  
Wing and Inside or Outside.....60¢5¢  
Double.....60¢  
Sargent's (Call's Pat. Inside).....30¢  
Excelsior.....30¢  
J. Stevens & Co.'s.....35¢10¢  
Starrett's.....25¢10¢

**Coopers' Tools—See Tools, Coopers'.**

**Cord—**

**Sash.**

Common.....5¢, 10¢ @ 11¢  
Patent, good quality.....5¢, 12¢ @ 12¢  
White Cotton Braided, fair.....24¢ @ 20¢  
Common Russia Sash.....5¢, 12¢ @ 13¢  
Patent Russia Sash.....5¢, 12¢ @ 14¢  
Cable Laid Italian Sash.....5¢, 21¢ @ 22¢  
Inola Cable Laid Sash.....5¢, 12¢ @ 12¢  
Silver Lace.....

A Quality, White, 50¢.....25¢  
A Quality, Drab, 55¢.....25¢  
B Quality, White, 30¢.....10¢  
B Quality, Drab, 35¢.....10¢  
Sylvan Spring Extra Braided White, 34¢  
Sylvan Spring, Extra Braided, Drab, 35¢  
Semper Idem Braided, White.....30¢  
Egyptian, India Hemp, Braided.....30¢  
Massachusetts, White.....25¢  
Samson.....

Braided, White Cotton, 50¢.....30¢30¢5¢  
Braided, Drab Cotton, 55¢.....30¢30¢5¢  
Braided, Italian Hemp, 55¢.....30¢30¢5¢  
Braided, Lichen, 8¢.....30¢30¢5¢  
Tate's Cotton Braided, White.....5¢, 25¢ @ 25¢

**Wire Picture.**

Braided or Twisted.....75¢10¢

**Corkscrews—See Screws, Cork.**

**Corn Knives and Cutters—See Knives, Corn.**

**Crackers, Nut—**

Table (H. & B. Mfg. Co.).....40¢  
Blake's Pattern.....5¢ doz \$25.00, 10¢  
Turner & Seymour Mfg. Co.....60¢

**Cradles—**

Grain.....50¢55¢50¢10¢25¢

**Crays.**

White Crays, 5¢ gross.....10¢  
D. M. Stewart Mfg. Co., Metal Work-  
ers, 5¢ gr. \$2.50.....25¢  
D. M. Stewart Mfg. Co., Rolling Mill,  
5¢ gr. \$2.50.....25¢  
See also Chalk.

**Urew Bars—See Bars, Crow.**

**Curry Combs—See Combs, Curry.**

**Curtain Pins—See Pins, Curtain.**

**Cutters—**

**Ment.**

Dixon's 5¢ doz.....40¢25¢  
Nos.....1 2 3 4 5  
\$14.00 \$17.00 \$19.00 \$20.00  
Woodruff's 5¢ doz.....40¢25¢  
Nos.....100 150  
\$15.00 \$18.00  
Hales Pattern 5¢ doz.....70¢70¢25¢  
Nos.....11 12 13  
\$27.00 \$33.00 \$45.00  
American.....30¢  
Nos.....1 2 3 4 5  
Each.....\$5 \$7 \$10 \$25 \$50 \$60  
Enterprise.....50¢  
Nos.....10 12 22 32 42  
Each.....\$3 \$2.50 \$4 \$6 \$10  
Great American Meat Cutter.....30¢  
Nos.....112 116 118 120 122  
Each.....\$2.00 \$2.75 \$3.00 \$2.50 \$4.00  
Miles' Challenge 5¢ doz.....45¢45¢10¢  
Nos.....2 3  
\$32.00 \$36.00 \$40.00  
Home No. 1.....5¢ doz \$25.00 \$45¢10¢

**Draw Cut, each:**

Nos. 6 8 10  
\$50 \$75 \$90 \$225.....20¢25¢  
Great American.....30¢10¢30¢  
Beef Shavers (Enterprises).....30¢10¢30¢  
Little Giant (P. S. & W. Co.).....50¢  
Chadborn's Smoked Beef Cutter, 5¢ doz  
Tobacco.....85¢10¢

Champion.....20¢10¢30¢  
Wood Bottom.....5¢ doz \$5.00 @ \$5.25  
All Iron.....5¢ doz \$4.25  
Nashua Lock Co.'s.....5¢ doz \$15.00 50¢55¢  
Wilson's.....5¢ doz \$24. 55¢10¢  
Acme.....5¢ doz \$20.00, 40¢

**Washer.**

Smith's Pat.....5¢ doz \$12.00, 20¢10¢10¢  
Johnson's.....5¢ doz \$11.00, 33¢10¢  
Penny's.....5¢ doz Pol. \$15; Jap'd, \$16.00, 55¢  
Spletton's.....5¢ doz \$16.00, 50¢10¢  
Bonner's.....5¢ doz \$16.00, 30¢10¢  
Cincinnati.....25¢10¢

**Dampers, &c—**

Dampers, Buffalo.....40¢10¢  
Buffalo Damper Clips.....40¢10¢  
Crown Damper.....40¢  
Excelsior.....40¢10¢

**Diggers, Post Hole, &c—**

Samson Post Hole Digger, 5¢ doz \$36.00, 25¢  
Fletcher Post Hole Augers, 5¢ doz \$36. 20¢  
Eureka Diggers.....5¢ doz \$12.50 @ \$14.00  
Leed's.....5¢ doz \$8.00 @ \$9.00  
Vaughan's Post Hole Auger, 5¢ doz  
\$13.00 @ \$14.00  
Kohler's Little Giant.....5¢ doz \$13.00  
Kohler's Hercules.....5¢ doz \$15.00  
Kohler's New Champion.....5¢ doz \$18.00  
Schneider.....5¢ doz \$18.00  
Ryan's Post Hole Diggers.....5¢ doz \$24.00  
Cronk's Post Bars, 5¢ doz \$60.00,  
50¢ @ \$60.00  
Gibbs Post Hole Digger, 5¢ doz \$30.00, 50¢  
Imperial, 5¢ doz \$15.....45¢

**Dividers—**

See Compasses.

**Dog Collars—See Collars, Dog, &c.**

**Door Springs—See Springs, Door.**

**Drawers.**

Money, 5¢ doz.....\$15¢30

**Drawing Knives—See Knives, Drawing.**

**Drills and Drill Stocks—**

Blacksmiths'.....each \$1.75  
Blacksmiths' Self-Feeding, each \$7.50, 20¢  
Breast, P. S. & W.....40¢10¢  
Breast, Wilson's.....30¢5¢  
Breast, Millers Falls.....each \$3.00, 25¢  
Breast, Bartholomew's.....each \$2.50,  
25¢10¢40¢  
Ratchet, Merrill's.....30¢20¢5¢  
Ratchet, Ingerroll's.....25¢  
Ratchet, Parker's.....30¢20¢5¢  
Ratchet, Whitney's.....30¢10¢  
Reichert, Weston's.....20¢25¢  
Ratchet, Moore's Triple Action.....45¢30¢  
Ratchet, Curtis & Curtis.....30¢  
Whitney's Hand Drill, Plain.....\$11.00,  
Adjustable, \$12.00.....\$10.10  
Wilson's Drill Stocks.....10¢  
Automatic Boring Tools.....\$1.75 @ \$1.85  
Twist Drills.....

Morse.....50¢10¢5¢  
Standard.....60¢1¢45¢  
Syracuse (Metal List).....50¢10¢  
Cleveland.....50¢10¢5¢  
Williams.....50¢10¢10¢  
New Process.....50¢10¢5¢  
Graham's Pat. Groove Shank 50¢10¢5¢

**Drill Bits.—See Augers and Bits.**

**Drill Chucks.—See Chucks.**

**Dripping Pans—See Pans, Dripping.**

**Drivers, Screw.**

Douglas Mfg. Co.....30¢20¢10¢  
Dixon's.....50¢  
Buck Bros.....30¢  
Stanley R. & L. Co.'s  
Black Handles.....65¢10¢  
Sargent & Co.'s.....60¢10¢  
No. 1 Forged Blade.....60¢10¢10¢  
Nos. 20, 30 and 60.....60¢10¢10¢  
P. S. & W.....70¢  
Knapp & Cowles:  
No. 1.....60¢20¢70¢  
No. 2.....60¢10¢70¢5¢  
No. 3.....60¢5¢90¢10¢  
Nos. 4 and 00, Acme and Ideal.....50¢  
Stearns'.....50¢50¢10¢5¢  
Gay & Parsons.....35¢  
Champion.....25¢10¢  
Clark's Pat.....30¢55¢45¢  
Crawford's Adjustable.....30¢  
Ellrich's Socket and Ratchet.....25¢5¢  
Allard's Spiral, new list.....25¢  
Kohl's Common Sense 5¢ doz \$6.00, 25¢10¢  
Syracuse Screw-Drive Bits.....30¢30¢5¢  
Screw-Drive Bits, Parr's.....5¢ gr. \$0.25  
Fray's Hol. Hdle. Sets, No. 3.....25¢35¢10¢  
P. D. & Co.'s all Steel.....50¢  
Cincinnati.....25¢10¢  
Brace Screw Drivers.....25¢10¢  
Buck Bros' Screw-Drive Bits.....

**Egg Beaters.—See Beaters, Egg.**

**Egg Pouchers.—See Pouchers, Egg.**

**Electric Bell Sets.—See Bells, Electric.**

**Emery.—No. 4 to No. 54 to Flour C.F.**

40 gr. 150 gr. 5¢ FF  
Kegs, 5¢ doz.....45¢ 5¢ 25¢  
1/2 kegs, 5¢ doz.....54¢ 25¢  
1/4 kegs, 5¢ doz.....54¢ 3¢  
10-lb cans, 10¢  
in case, 10¢ 84¢ 5¢  
10-lb cans, less  
than 10.....10¢ 10¢ 75¢

**Enameled and Tinned Ware—**  
See Ware, Hollow.

**Escutcheon Pins—See Pins, Escutcheon.**

**Escutcheons.**

Door Lock.....Same as Door Locks.  
Brass Thread.....60¢60¢10¢  
Wood.....25¢

**Expanded Metal.**

List No. 5.

Lathing.....10¢  
Fencing, Painted Sheets.....20¢  
Netting, Painted Sheets.....20¢  
Door Mats, Galvanized.....25¢  
Window Guards, Painted.....15¢  
Tree Guards, Painted.....15¢

**Extractors, Lemon Juice—See Squeezers, Lemon.**

**Fasteners, Blind—**

Mackrell's, 5¢ doz \$1.00.....20¢20¢10¢  
Van Sand's Screw Pat., 15¢ gr.....60¢10¢  
Van Sand's Old Pat., 15¢ gr.....55¢10¢  
Washburn's Old Pattern, 5¢ gr.....50¢  
Merriman's.....New ls.  
Austin & Eddy No. 2008 5¢ gr.....50¢  
Security Gravity, 5¢ gr.....50¢

**Faucets.—**

Fenn's.....40¢  
Bohren's Pat. Rubber Ball.....25¢  
Fenn's Cork Stops.....33¢5¢  
Star.....60¢  
Frary's Pat. Petroleum.....40¢5¢25¢  
B. & L. B. Co.  
West's Lock, Open and Shut Key.....50¢  
Star Metal Plug, new list.....40¢  
Lockport, Metal Plug, reduced list.....60¢  
Metallic Key, Leather Lined.....60¢10¢  
Cork Lined.....70¢5¢70¢10¢  
Burnside's Red Cedar.....50¢  
Burnside's Red Cedar, bbl lots.....50¢10¢  
John Sommers'.....

Peerless Best Block Tin Key.....40¢  
KX, 1st quality, Cork Lined.....50¢  
Diamond Lock.....50¢  
Perfection, Fla. Red Cedar.....50¢  
Goodenough Cedar.....50¢  
Boss Metallic Key.....50¢  
Reliable Cork Lined.....60¢  
Western Pattern Cork Lined.....50¢

**Self-Measuring.**

Enterprise, 5¢ doz \$50.00.....90¢10¢  
Lane's, 5¢ doz \$50.00.....35¢10¢  
Victor, 5¢ doz \$36.00.....25¢10¢

**Felloe Plates—See Plates, Felloe.**

**Fifth Wheels.—**

Derby and Cincinnati.....45¢25¢  
Brewster.....50¢25¢

**Files—**

**Domestic.**

Nicholson Files, Rasps, &c.....60¢10¢60¢10¢5¢  
Nicholson (X. F.) Files.....25¢  
Nicholson's Royal Files (Seconds).....75¢  
Extra prices on certain sizes:  
G. & H. Barnett (Black Diamond).....60¢10¢80¢10¢5¢  
Eagle.....60¢10¢5¢60¢10¢10¢  
Other makers, best brands 60¢10¢60¢20¢  
Fair brands.....60¢10¢10¢70¢5¢  
Second quality.....70¢10¢75¢10¢  
Hellers Horse Rasps.....50¢7¢50¢10¢  
McCaffrey's Horse Rasps.....50¢10¢  
Chelsea Horse Rasps, Hand Cut.....50¢10¢  
**Imported.**  
Moss & Gamble.....List April 1 1883, 15¢  
Butcher.....Butcher's list, 3¢  
Stubbs.....Stubbs list, 25¢30¢  
Turton's.....Turton's list, 20¢25¢  
Greaves' Horse Rasps, American list, 60¢

**Fixtures.**

**Grindstone—**

Sargent's Patent.....70¢10¢  
Reading Hardware Co.....30¢10¢  
P. S. & W. Co.....50¢10¢

**Fluting Machines—See Machines, Fluting.**

**Fluting Scissors—See Scissors, Fluting.**

**Fodder Squeezers—See Squeezers, Fodder.**

**Forks—**

Hay, Manure, &c., Asso List, 65¢5¢65¢10¢  
Hay, Manure, &c., Phila. List, 60¢60¢5¢  
Plated, see Spoons.

**Frames—**

**Saw—**

White Vermont.....5¢ gr. \$0.00 @ \$0.10  
Red, Polished and Varnished.....5¢ doz  
\$1.50, 25¢

**Screen, Window and Door—**

Porter's Pat. Window and Door Frame.....33¢10¢  
Warner's Screen Corner Irons.....33¢10¢  
Stearns' Frames and Corners.....33¢10¢  
Cortland.....40¢40¢5¢

**Freezers, Ice Cream—**

White Mountain.....60¢60¢25¢  
Granite State.....65¢65¢25¢  
Arctic.....70¢70¢5¢  
American.....60¢  
Buffalo Champion.....65¢65¢25¢  
Shenard's Lightning.....65¢65¢25¢  
Gem.....60¢  
Hissard.....70¢  
Double Action Crown.....60¢  
Crown.....60¢  
Star.....60¢  
Peerless.....60¢10¢  
Giant.....60¢  
Zero.....60¢10¢10¢  
Boss and Pat.....6¢10¢10¢10¢  
Keystone, P. D. & Co., each \$1.00.....30¢

**Fruit and Jelly Presses—See Presses, Fruit and Jelly.**

**Fry Pans—See Pans, Fry.**

**Funnels.**

Gersdorff's Perfection, Standard and Globe: 7 1/2 gr. 10 1/2; 2 to 5 gr., 20 1/2; 5 to 10 gr., 15 1/2; 10 to 20 gr., 10 1/2; 20 to 30 gr., 10 1/2; 30 to 40 gr., 10 1/2; 40 to 50 gr., 10 1/2; 50 to 60 gr., 10 1/2; 60 to 70 gr., 10 1/2; 70 to 80 gr., 10 1/2; 80 to 90 gr., 10 1/2; 90 to 100 gr., 10 1/2; 100 to 110 gr., 10 1/2; 110 to 120 gr., 10 1/2; 120 to 130 gr., 10 1/2; 130 to 140 gr., 10 1/2; 140 to 150 gr., 10 1/2; 150 to 160 gr., 10 1/2; 160 to 170 gr., 10 1/2; 170 to 180 gr., 10 1/2; 180 to 190 gr., 10 1/2; 190 to 200 gr., 10 1/2; 200 to 210 gr., 10 1/2; 210 to 220 gr., 10 1/2; 220 to 230 gr., 10 1/2; 230 to 240 gr., 10 1/2; 240 to 250 gr., 10 1/2; 250 to 260 gr., 10 1/2; 260 to 270 gr., 10 1/2; 270 to 280 gr., 10 1/2; 280 to 290 gr., 10 1/2; 290 to 300 gr., 10 1/2; 300 to 310 gr., 10 1/2; 310 to 320 gr., 10 1/2; 320 to 330 gr., 10 1/2; 330 to 340 gr., 10 1/2; 340 to 350 gr., 10 1/2; 350 to 360 gr., 10 1/2; 360 to 370 gr., 10 1/2; 370 to 380 gr., 10 1/2; 380 to 390 gr., 10 1/2; 390 to 400 gr., 10 1/2; 400 to 410 gr., 10 1/2; 410 to 420 gr., 10 1/2; 420 to 430 gr., 10 1/2; 430 to 440 gr., 10 1/2; 440 to 450 gr., 10 1/2; 450 to 460 gr., 10 1/2; 460 to 470 gr., 10 1/2; 470 to 480 gr., 10 1/2; 480 to 490 gr., 10 1/2; 490 to 500 gr., 10 1/2; 500 to 510 gr., 10 1/2; 510 to 520 gr., 10 1/2; 520 to 530 gr., 10 1/2; 530 to 540 gr., 10 1/2; 540 to 550 gr., 10 1/2; 550 to 560 gr., 10 1/2; 560 to 570 gr., 10 1/2; 570 to 580 gr., 10 1/2; 580 to 590 gr., 10 1/2; 590 to 600 gr., 10 1/2; 600 to 610 gr., 10 1/2; 610 to 620 gr., 10 1/2; 620 to 630 gr., 10 1/2; 630 to 640 gr., 10 1/2; 640 to 650 gr., 10 1/2; 650 to 660 gr., 10 1/2; 660 to 670 gr., 10 1/2; 670 to 680 gr., 10 1/2; 680 to 690 gr., 10 1/2; 690 to 700 gr., 10 1/2; 700 to 710 gr., 10 1/2; 710 to 720 gr., 10 1/2; 720 to 730 gr., 10 1/2; 730 to 740 gr., 10 1/2; 740 to 750 gr., 10 1/2; 750 to 760 gr., 10 1/2; 760 to 770 gr., 10 1/2; 770 to 780 gr., 10 1/2; 780 to 790 gr., 10 1/2; 790 to 800 gr., 10 1/2; 800 to 810 gr., 10 1/2; 810 to 820 gr., 10 1/2; 820 to 830 gr., 10 1/2; 830 to 840 gr., 10 1/2; 840 to 850 gr., 10 1/2; 850 to 860 gr., 10 1/2; 860 to 870 gr., 10 1/2; 870 to 880 gr., 10 1/2; 880 to 890 gr., 10 1/2; 890 to 900 gr., 10 1/2; 900 to 910 gr., 10 1/2; 910 to 920 gr., 10 1/2; 920 to 930 gr., 10 1/2; 930 to 940 gr., 10 1/2; 940 to 950 gr., 10 1/2; 950 to 960 gr., 10 1/2; 960 to 970 gr., 10 1/2; 970 to 980 gr., 10 1/2; 980 to 990 gr., 10 1/2; 990 to 1000 gr., 10 1/2; 1000 to 1010 gr., 10 1/2; 1010 to 1020 gr., 10 1/2; 1020 to 1030 gr., 10 1/2; 1030 to 1040 gr., 10 1/2; 1040 to 1050 gr., 10 1/2; 1050 to 1060 gr., 10 1/2; 1060 to 1070 gr., 10 1/2; 1070 to 1080 gr., 10 1/2; 1080 to 1090 gr., 10 1/2; 1090 to 1100 gr., 10 1/2; 1100 to 1110 gr., 10 1/2; 1110 to 1120 gr., 10 1/2; 1120 to 1130 gr., 10 1/2; 1130 to 1140 gr., 10 1/2; 1140 to 1150 gr., 10 1/2; 1150 to 1160 gr., 10 1/2; 1160 to 1170 gr., 10 1/2; 1170 to 1180 gr., 10 1/2; 1180 to 1190 gr., 10 1/2; 1190 to 1200 gr., 10 1/2; 1200 to 1210 gr., 10 1/2; 1210 to 1220 gr., 10 1/2; 1220 to 1230 gr., 10 1/2; 1230 to 1240 gr., 10 1/2; 1240 to 1250 gr., 10 1/2; 1250 to 1260 gr., 10 1/2; 1260 to 1270 gr., 10 1/2; 1270 to 1280 gr., 10 1/2; 1280 to 1290 gr., 10 1/2; 1290 to 1300 gr., 10 1/2; 1300 to 1310 gr., 10 1/2; 1310 to 1320 gr., 10 1/2; 1320 to 1330 gr., 10 1/2; 1330 to 1340 gr., 10 1/2; 1340 to 1350 gr., 10 1/2; 1350 to 1360 gr., 10 1/2; 1360 to 1370 gr., 10 1/2; 1370 to 1380 gr., 10 1/2; 1380 to 1390 gr., 10 1/2; 1390 to 1400 gr., 10 1/2; 1400 to 1410 gr., 10 1/2; 1410 to 1420 gr., 10 1/2; 1420 to 1430 gr., 10 1/2; 1430 to 1440 gr., 10 1/2; 1440 to 1450 gr., 10 1/2; 1450

**Hangers—**

Barn Door, old patterns.....	60¢10¢10¢70¢
Barn Door, New England.....	60¢10¢10¢70¢
Samson Steel Anti-Friction.....	55¢
Orleans Steel.....	55¢
Hamilton Wrought Wood Track.....	55¢
U. S. Wood Track.....	65¢
Champion.....	60¢10¢
Rider and Wooster, Medina Mfg. Co.'s List.....	70¢
Climax Anti-Friction.....	55¢
Climax Anti-Friction for Wood Track.....	55¢
Zenith for Wood Track.....	55¢
Reed's Steel Arm.....	60¢
Challenge, Barn Door.....	60¢
Sterling.....	50¢50¢10¢
Victor, No. 1, \$15.00; No. 2, \$18.50; No. 3, \$15.00.....	50¢10¢
Cheritree.....	50¢10¢
Kidder's.....	50¢10¢60¢
The Boss.....	60¢10¢
Best Anti-Friction.....	60¢10¢
Duplex (Wood Track).....	60¢10¢10¢
Terry's Pat., 4 in. pr. 4 in., \$10.00; 5 in., \$12.00.....	50¢10¢
Terry's Steel Anti-Friction Leader.....	50¢10¢
Terry's Steel Anti-Friction Ideal.....	50¢10¢
Cronk's Patent, Steel Covered.....	50¢5¢
Wood Track Iron Clad, 7 ft. 10 in.....	50
Carrier Steel Anti-Friction.....	45¢10¢
Architect, 4 in. pr. \$6.00.....	50¢10¢
Solips.....	30¢10¢
Felix, 4 in. pr. \$4.50.....	20¢
Richards'.....	30¢50¢10¢
Lane's Standard.....	50¢50¢10¢
Lane's New Standard.....	50¢50¢10¢
Ball Bearing Door Hanger.....	50¢10¢25¢10¢
Warner's Pat.....	50¢10¢25¢10¢
Stearns' Anti-Friction.....	50¢10¢25¢10¢
Stearns' Challenge.....	25¢10¢25¢10¢
Faultless.....	40¢40¢5¢
American, 4 in. pr. \$6.00.....	20¢10¢
Rider & Wooster, No. 1, 62¢; No. 2, 74¢.....	40¢
Paragon, Nos. 1, 2 and 3.....	40¢10¢
Cincinnati.....	40¢10¢
Paragon, Nos. 5, 5 1/2, 7 and 8.....	20¢10¢
Crecent.....	60¢60¢10¢
Nickel Cast Iron.....	50¢
Scranton Anti-Friction Single Strap.....	40¢
Wild West, 4 in. Wheel, \$15.00; 5 in., \$21.00.....	40¢10¢
Star.....	40¢10¢40¢10¢
May.....	50¢50¢50¢10¢
Barry, 76.00.....	40¢10¢
Interstate.....	50¢
Magie.....	45¢

**Harness Snaps—See Snaps.****Hatchets—**

American Axe and Tool Co.	
Blood's.....	
Hunt's.....	
Hurd's.....	
Mann's.....	
Peck's.....	
Underhill's.....	40 & 10
Buffalo Hammer Co.	
Fayette R. Plumb.....	50¢5¢
C. Hammond & Son.....	
Kelly's.....	
Gargant & Co.....	
P. S. & W. Co.....	
Ten Eyck Edge Tool Co.....	
Collins.....	
Schulte, Lohoff & Co.....	50¢50¢25¢

**Hay and Straw Knives—See Knives.****Hinges—**

Blind Hinges—	
Parker.....	75¢25¢
Palmer.....	50¢50¢10¢
Seymour.....	70¢25¢
Stuffer.....	50¢
Clark's, Nos. 1, 3, 5, 40 and 50.....	75¢10¢50¢
Clark's Morris Gravity.....	50¢
Sargent's, Nos. 1, 3, 5, 11, 13.....	75¢10¢55¢10¢5¢
Sargent's, No. 12.....	77¢10¢
Reading's Gravity.....	75¢10¢75¢10¢5¢
Shepard's.....	
No. 10.....	75¢10¢
Niagara.....	30¢
Palmer.....	30¢
Clark's Gravity Pattern.....	30¢
O. S., Lull & Porter.....	75¢10¢
Acme, Lull & Porter.....	75¢10¢
Queen City Reversible.....	70¢10¢50¢75¢
Clark's Lull & Porter, No. 1, 1 1/2, 2, 2 1/2, 3.....	75¢10¢25¢
North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....	10¢

Gate Hinges—	
Western.....	40¢ \$4.40, 60¢
N. E.....	40¢ \$7.00, 50¢
H. E. Reversible.....	40¢ \$5.20, 55¢10¢
Clark's, Nos. 1, 2, 3.....	60¢10¢55¢
N. Y. State.....	40¢ \$5.00, 55¢10¢
Automatic.....	40¢ \$12.50, 50¢
Common Sense.....	40¢ pair \$4.50, 60¢
Seymour's.....	45¢10¢
Shepard's.....	60¢10¢55¢
Reed's Latch and Hinges.....	40¢ \$12.00, 50¢

Spring Hinges—	
Geer's Spring and Blank Butts.....	40¢
Union Spring Hinge Co.'s List, March 1891.....	30¢
Acme.....	80¢
O. S.....	80¢
Empire and Crown.....	25¢10¢
Hero and Monarch.....	85¢
American, Gem, and Star.....	20¢
Oxford.....	20¢
Barker's Double Acting.....	25¢
Union Mfg. Co.....	25¢
Bommer's.....	20¢
Buckman's.....	15¢20¢
Chicago.....	30¢
Wiles.....	10¢
Devore's.....	40¢
Reed.....	40¢
Royal.....	40¢
Reliable.....	60¢
Champion.....	60¢
Barley's Patent.....	40¢
Stearns'.....	50¢10¢
Niagara, Holdback pattern, per gross.....	\$14.00

**Wrought Iron Hinges**

List February 14, 1891.

Strap and T..... 50¢10¢

Corrugated Strap and T.....	50 & 10 %
Screw Hook and.....	6 to 12 in., 5¢ 1/2, 4¢
Strap.....	14 to 20 in., 5¢ 3/4, 4¢
Strap.....	22 to 36 in., 5¢ 7/8, 4¢
Screw Hook and Eye.....	1/4 in., 5¢ 1/2, 4¢
Screw Hook and Eye.....	3/4 in., 5¢ 1/2, 4¢
Screw Hook and Eye.....	1 in., 5¢ 1/2, 4¢
Roller Blind Hinges, Nos. 22 and 34.....	60¢10¢
Roller Blind Hinges, Nos. 232 and 234.....	60¢10¢
Roller Plate.....	70¢10¢
Roller Raised.....	70¢10¢
Plate Hinges, 8, 10 & 12 in., 5¢ 1/2, 4¢.....	70¢10¢
"Providence".....	over 12 in., 5¢ 1/2, 4¢

**Hoes—**

Eye—	
D. & H. Scovill.....	20¢
Lane's Crescent Planter Pattern.....	45¢5¢
Lane's Razor Blade, Scovill Pattern.....	30¢
Maynard, S. & O. Pat.....	45¢5¢
Sandusky Tool Co., S. & O. Pat.....	50¢10¢5
Am. Axe and Tool Co., S. & O.....	60¢
Chattanooga Tool Co., S. & O. Pat.....	50¢60¢10¢
Grub.....	60¢10¢

**Handled—**

Garden, Mortar, &c.....	70¢
Planter's, Cotton &c.....	70¢
Warren Hoe.....	60¢
Magie.....	50¢ \$4.00

**Hog Rings and Rings—See Rings and Rings.****Holding Apparatus—See Machines, Holding.****Hollow-Ware—See Ware, Hollow.****Holders.**

Bag.	
Sprengle's Pat.....	50¢ \$18.....
Bit.	
Extension.	
Barber's, 4 in. pr. \$15.00.....	40¢40¢10¢
Ives, 4 in. pr. \$20.00.....	60¢5¢60¢10¢
Diagonal.....	50¢ \$24.00, 40¢
Angular.....	50¢ \$24.00, 40¢5¢

**File and Tool—**

Bals Pat.....	50¢ \$4.00, 25¢
Nicholson File Holders.....	30¢
Dick's Tool Holder.....	30¢

**Hooks—**

Cast Iron—	
Bird Cage, Sargent's List.....	
Bird Cage, Reading.....	60¢10¢10¢
Clothes Line, Sargent's List.....	
Clothes Line, Reading List.....	60¢10¢80¢10¢10¢
Celling Sargent's List.....	55¢10¢10¢
Harness, Reading List.....	55¢10¢55¢10¢10¢
Coat and Hat, Sargent's List.....	55¢10¢60¢10¢
Coat and Hat, Reading.....	50¢10¢50¢10¢10¢

**Wrought Iron—**

Cotton.....	50¢ \$1.35
Cotton Pat. (N. Y. Mallet & Handle Wks.).....	30¢
Tassel and Picture (T. & S. Mfg. Co.).....	50¢
Wrought Staples, Hooks, &c.....	See Wrought Goods.

**Wire—**

Wire Coat and Hat, Gem, List April, 1888.....	60¢
Wire Coat and Hat, Miles, List April, 1888.....	60¢
Indestructible Coat and Hat.....	45¢
Wire Coat and Hat, Standard.....	60¢
Handy Hat and Coat.....	50¢10¢
Steady Ceiling Hooks.....	30¢80¢10¢
Belt.....	30¢80¢10¢
Atlas Coat and Hat.....	30¢80¢10¢
Bright Wire Goods, see Wires.....	

**Miscellaneous.**

Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50.....	
Noll's Grass.....	50¢ \$2.25
Bush.....	55¢60¢
Whiffletree—Patent.....	50¢
Hooks and Eyes—Malleable Iron.....	70¢70¢10¢
Hooks and Eyes—Brass.....	50¢10¢10¢
Fish Hooks, American.....	50¢
Bench Hooks.....	See Bench Stops.

**Horse Nails—See Nails, Horse.****Horse Shoes—See Shoes, Horse.****Hose, Rubber—**

Competition.....	75¢75¢5¢
Standard.....	60¢10¢55¢60¢10¢10¢
Extra.....	40¢10¢60¢
N. Y. B. & P. Co., Para.....	25¢25¢
N. Y. B. & P. Co., Extra.....	40¢40¢5¢
N. Y. B. & P. Co., Dundee.....	50¢10¢ 60¢

**Huskers—**

Blair's Adjustable.....	40¢ \$8.00
Blair's Adjustable Clipper.....	40¢ \$7.00
Hubbard's Solid Steel.....	40¢ \$4.50

**Indurated Fiber-Ware—See Ware, Indurated Fiber.****Irons.**

Sad—	
From 4 to 10, at factory.....	100 ¢
Self-Heating.....	25¢30¢\$2.40
Self-Heating, Tailors'.....	40¢ \$9.00 net
Mrs. Pott's Irons.....	60¢\$9.10¢
Enterprise Star Irons.....	60¢50¢10¢
X X Cold Handle Sad Iron.....	60¢5¢60¢
Ideal Irons new List.....	50¢10¢50¢ 10¢10¢
Salamander, Irons.....	35¢
B. B. Sad Irons, 5 in.....	30¢\$4
Combined Fluter and Sad Iron, 5 in.....	\$15.00
For Reversible, Self-Fluter.....	40¢ \$24.00
Chinese Laundry (N. E. Butt Co.).....	5¢ 1/2, 15¢
New England.....	5¢ 1/2, 15¢
Mahony's Troy Pol. Irons.....	25¢
Sensible, List Jan. 91.....	50¢10¢5¢
Sensible Tailor's Irons.....	35¢ 1/2
National Self-Heating.....	30¢

**Soldering.**

Cover's Adjustable, List Jan. 1 1886.....	25¢
Jack Screws—See Screws.	
Jack, Wagon.....	
Daily.....	40¢
Victor.....	40¢
Lockport.....	40¢

**Kettles—**

Brass, Cabinet, List Jan. 1, '91.....	25¢5¢
Brass, Spun, Pld. W. M. List Jan. 1, '91.....	30¢
Enameled and Tea—See Hollow Ware.	

**Keys—**

Lock Ass'n's List Dec. 30, 1886.....	50¢10¢
Eagle, Cabinet, &c.....	35¢5¢
Hotchkiss' Brass Blank.....	40¢
Hotchkiss, Copper and Tinned.....	40¢
Hotchkiss' Pad, and Cab.....	35¢
Ratchet Bed Keys.....	50¢ \$4.00, 15¢
Wollensak Tinned.....	50¢10¢

**Knife Sharpeners—See Sharpeners, Knife.****Knives.**

Butcher, Shoe, &c—	
Wilson's Butcher Knives, List Dec. 8, 1890.....	25¢
Amer's Butcher Knives.....	25¢
Foster's Butcher, &c.....	40¢
Jordan's A A A, Butchers', List.....	40¢
Nichols' Butcher Knives.....	40¢10¢
W. W. Wilson, Butcher, 6 in., \$2.00; 7 in., \$2.50; 8 in., \$3.50, &c.....	7
Amer's Shoe Knives.....	20¢25¢
Amer's Bread Knives, 5 in. \$1.50, 15¢20¢ Moran's Shoe and Bread.....	30¢
Hay and Straw.....	See Hay Knives.
Table and Pocket.....	See Cutlery.
Corn, Auburn Mfg. Co. Western Pat.....	\$2.00
Corn, Auburn Mfg. Co. Crescent.....	\$3.50
Bradley's.....	10¢
Wadsworth's.....	35¢

**Drawing—**

Wetherby.....	
P. S. & W.....	75¢ 75¢10 ¢
New Haven.....	
Merrill.....	60¢10¢60¢10¢5¢
Douglas.....	75¢75¢25¢
Watrous.....	15¢10¢25¢
L. & J. White.....	20¢25¢
Diagonal.....	35¢
Adjustable Handle.....	35¢5¢
Wilkinson's Folding.....	25¢25¢5¢

**Hay and Straw—**

Lightning, from jobbers.....	\$8.00 @ \$9.00
Wadsworth's.....	40¢75¢40¢10¢
Carter's Needle.....	50¢ \$11.00 @ \$11.50
Heath's.....	50¢ \$13.00 @ \$13.50
Auburn Hay, Corn, and Spear Point.....	50¢
Auburn, Straw.....	40¢
Noll's Hay.....	50¢ \$7.00, 40¢

**Mining.**

Am. (3d quality), 7 gr., 1 blade, \$7; 2 blades, \$12; 3 blades, \$18.....	50¢10¢
Lothrop's.....	50¢10¢
Smith's, 7 gr., Single, \$2.00; Double, \$3 Knapp & Cowles.....	40¢40¢5¢
Buffalo Adjustable.....	50¢ \$3.00, 25¢
Buffalo Double Adj'table.....	50¢ \$3.00, 25¢

**Knobs—**

Door Mineral.....	60¢65¢
Door Por. Nickel.....	70¢10¢
Door Por. Nickel.....	50¢ \$2.25
Door Por. Plated, Nickel.....	\$2.00 @ \$2.25
Drawer, Porcelain.....	60¢10¢60¢10¢10¢
Hemacite Door Knobs.....	40¢10¢50¢
Yale & Towne Wood, List Dec., 1885.....	40¢
Furniture, Plain.....	75¢ gro inch, 10¢
Base, Rubber Tip.....	70¢10¢5¢
Picture, Judd's.....	60¢10¢10¢70¢
Picture, Sargent's.....	70¢10¢
Picture, Hemacite.....	35¢5¢
Shutter, Porcelain.....	65¢10¢
Carriage, Jap.....	80¢ gro, 60¢10¢
Barley's Wood Door, Shutter, &c.....	40¢

**Ladies—**

Melting, Sargent's.....	55¢10¢
Melting, Reading.....	55¢10¢
Melting, Monroe's Pat.....	50¢ \$4.00, 40¢
Melting, P. S. & W.....	35¢10¢40¢
Melting, Warner's.....	30¢

**Lanterns—**

Tubular—	
Plain with Guards, 7 gr.....	\$3.75 @ 4.00
List Wire, with Guards.....	\$4.00 @ 4.25
Square Plain, with Guards.....	\$3.75 @ 4.00
Sq. List Wire, with Guards.....	\$4.50

**Police Lanterns (including packages).**

2 1/2-inch Bull's-eye Police regular.....	50¢ \$3.00
3-inch Bull's-eye Police regular.....	50¢ \$3.50
2 1/2-inch Bull's-eye Police flash light.....	50¢ \$4.00
3-inch Bull's-eye Police flash light.....	50¢ \$4.50

**Lawn Mowers—See Mowers, Lawn.****Leaders, Cattle.**

Humason, Beckley & Co.'s.....	70¢
Sargent's.....	60¢\$10¢
Hotchkiss.....	30¢
Peck, Stow & W. Co.....	60¢10¢

**Lemon Squeezers—See Squeezers, Lemon.****Lifters, Transom.**

Wollensak's:	
Class 3 and 4, Bronzed Iron.....	50¢
Class 3 and 4, Bronze Metal.....	25¢
Class 3 and 4, Brass.....	35¢
Skylight Lifters.....	35¢
Crown, Eagle and Shield.....	50¢
Reiter's, List Feb. 20, 1891.....	50¢10¢10¢25¢
Bronzed Iron Rods.....	30¢
Brass, Real Bronze or Wollensak's Plate.....	30¢
Exeolator.....	50¢10¢25¢
Shaw's.....	50¢10¢
Payson's:	
Universal.....	60¢
Solid Grip.....	60¢
Imperial.....	50¢10¢

**Lines—**

Cotton and Linen Fish, Draper's.....	50¢
Draper's and Tate's Chalk.....	60¢
Draper's Mason's Linen, 84 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....	25¢
Cotton Chalk.....	55¢
Samson Cotton, No. 1, \$2; No. 4, \$2.50; No. 5, \$3.25.....	25¢
Silver Lake, Braided, No. 0, \$6.00; No. 1, 1.65; No. 2, \$7.00; No. 3, \$7.50; No	



**Mallets.**

Hickory.....20¢10¢20¢10¢10¢  
Lignumvite.....20¢10¢20¢10¢10¢  
R. & L. Block Co., Hickory & L. V.  
30¢30¢10¢

**Mattresses.**

Regular list.....60¢10¢60¢10¢25¢

**Measures.**

Standard Fiberware, No. 1, peck, #  
dozen, \$4; 1/2 peck, \$3.50.

**Meat Cutters.**

See Cutters, Meat.

**Menders, Harness.**

Per doz.....\$2.00

**Mills.**

Coffee—  
Box and Side, List Jan. 1, 1888.....60¢25¢  
American, Enterprise Mfg Co. 30¢10¢30¢  
The Swift, Lane Bros.....30¢10¢

**Mining Knives.**

See Knives, Mining.

**Molasses Gates.**

See Gates, Molasses.

**Money Drawers.**

See Drawers, Money.

**Mowers, Lawn.**

Pennsylvania, New Model, Excelsior,  
Continental, &c.....60¢60¢25¢  
Philadelphia.....60¢60¢25¢  
Perfection.....60¢10¢10¢  
Easy.....60¢10¢60¢10¢25¢  
Bay State.....60¢10¢60¢10¢25¢  
Other Machines.....60¢10¢60¢10¢25¢

**Muzzles.**

Safety.....# doz, \$3.00, 25¢

**Nails.**

Cut and Wire. See Trade Report.

Wire Nails, Papered.  
Association list, July 15 '89, 75¢10¢80¢  
Tack Mfrs' list.....70¢70¢10¢

Wire Nails, Standard Penny.  
Card June 1 '89 base.....\$2.10 to \$2.20

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**Padlocks.**

See Locks.

**Pails.**

Galvanized Iron—

Quarts 10 12 14

Hill's Light Weight, # doz, \$2.75 3.00 3.25

Hill's Heavy Weight, # doz, 3.00 3.25 3.75

Helwig's.....2.50 2.75 3.00

Sidney Shepard & Co.....2.50 2.85 3.00

Iron Clad.....2.50 2.75 3.00

Fire Buckets.....2.75 3.25 3.50

Buckets, see Well Buckets.

Indurated Fibre Ware—25¢

Star Pails, 12 qt.....# doz \$5.40

Stable and Milk, 14 qt.....# doz \$6.00

Fire Pails, deep.....# doz \$5.40

" round bottom.....# doz \$5.40

Standard Fibre Ware—

Plain, Dec'd

Water Pails, 12 qt., per doz.....\$4.00 \$4.50

Dairy Pails, 14 qt., per doz.....4.50 5.00

Fire Pails, No. 1, 12 qt., per doz.....4.50 5.00

Fire Pails, No. 2, 14 qt., per doz.....5.00 5.50

Sugar Pails.....6.00 6.50

Buggy Pails.....4.00

Slop Jars (bal. trap).....8.00 9.00

Chamber Pails, 14 qt.....6.50 7.50

**Pans.**

Dripping.

Small sizes.....# doz 6¢

Large sizes.....# doz 4¢

Silver & Co. (Covered).....40¢

**Pans.**

Standard List:

No. 0.....# doz \$3.00 \$3.75 \$4.35 \$4.75 \$5.25

No. 1.....# doz 5 6 7 8

# doz.....\$6.00 \$7.00 \$8.00 \$9.00

Polished, regular goods.....75¢75¢10¢

Acme Fry Pans.....60¢10¢

Dust—

Steel Edge, No. 1.....# doz \$1.75

Paper and Cloth—

Sand and Emery—

List April 19, 1886.....50¢50¢10¢

Sibley's Emery and Crocus Cloth.....30¢

**Parers.**

Apple.

Advance.....# doz \$4.75

Baldwin.....# doz 5.25

Bonanza.....each 5.00

Daisy.....# doz 4.00

Dandy.....each 7.50

Eclipse.....# doz 4.25

Eureka, 1888.....each 18.00

Family Bay State.....# doz 12.00

Favorite.....# doz 5.00

Gold Medal.....# doz 4.00

Ideal.....# doz 4.00

Improved Bay State.....# doz 27.00 \$30.00

Little Star.....# doz 4.50

Monarch.....# doz 13.50

New Lightning.....# doz 4.00

Orion.....# doz 4.00

Perfection.....# doz 4.00

Pomona.....# doz 4.00

Rocking Table.....# doz 6.00

Turn Table.....# doz 4.50

Victor.....# doz 4.00

Vulcan.....# doz 4.00

White Mountain.....# doz 4.00

72.....# doz 4.25

78.....# doz 7.00

Potato—

White Mountain.....# doz \$4.50

Antrim Combination.....# doz \$5.50

Rooster.....# doz \$12.50

Saratoga.....# doz \$5.50

Pencils—

Faber's Carpenters.....high list 50¢

Faber's Round Gilt.....# gro \$5.25

Dixon's Lead.....# gro \$4.50

Dixon's Lumber.....# gro \$6.75

Dixon's Carpenters.....10¢

Picks—

Railroad or Adse Eye, 5 to 6, \$12.00;

6 to 7, \$13.00.....60¢10¢60¢10¢25¢

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.

Humason, Beckley & Co.'s.....60¢10¢

Sargent & Co.'s.....\$17 and \$18.....60¢10¢

Peck, Stow & W Co., 50¢10¢50¢10¢25¢

Pipe, Wrought Iron—

List September 18, 1889.

14 and under, Plain.....52 1/2¢

14 and under, Galvanized.....42 1/2¢

14 and over, Plain.....62 1/2¢

14 and over, Galvanized.....50¢

Boiler Tubes.

Sizes up to 2 1/2 in. inclusive.....55¢

Sizes 3 to 4 in. inclusive.....60¢

Sizes 7 in. and up.....55¢

Casing.....55¢

Planes and Plane Irons—

Wood Planes—

Molding.....40¢10¢

Bench, First Quality.....50¢10¢

Bench, Second Quality.....55¢10¢

Bailey's (Stanley R. & L. Co.).....40¢10¢

From Planes—

Bailey's (Stanley R. & L. Co.).....40¢10¢

40¢10¢40¢10¢10¢

Miscellaneous Planes (Stanley R. & L. Co.).....30¢10¢20¢10¢10¢

Victor Planes (Stanley R. & L. Co.).....20¢10¢20¢10¢10¢

Steel's Iron Planes.....35¢35¢10¢

Meriden Mfg. Iron Co.'s.....40¢40¢10¢

David's Iron Planes.....40¢40¢10¢

Birmingham Plane Co.....50¢50¢10¢

Gage Tool Co.'s Self-Setting.....30¢10¢10¢

Chaplin's Iron Planes.....40¢40¢10¢

Sargent's.....30¢10¢10¢40¢10¢10¢

Standard Tool Co.....50¢50¢25¢

Plane Irons—

Butcher's.....\$5.00 to \$5.25 to 30¢

Buck Bros.....30¢

Auburn "Thistle".....30¢10¢

Sandusky.....30¢10¢

S. & J. White.....35¢

Plates.

Fellows.....# doz 6¢60¢4¢

**Pliers and Nippers.**

Button's Patent.....50¢50¢10¢

Hall's No. 2, 5 in. \$13.50; No. 4, 7 in.

\$21.00 # doz.....30¢10¢33¢4¢

**Hack Saws.**  
Griffin's complete, 40x10x50  
Griffin's Hack Saw, Blades, 40x10x50  
Star Hack Saws and Blades, 25x  
Bureka and Crescent, 25x

**Scroll.**  
Lester, complete, \$10.00, 25x  
Barnes, complete, \$4.00, 25x  
Barnes' Builders' and Cabinet Makers', \$15, 25x  
Barnes' Scroll Saw Blades, 25x

**Saw Frames.**—See Frames, Saw.  
**Saw Sets.**—See Sets, Saw.  
**Saw Tools.**—See Tools, Saw.

**Scales.**  
Hatch, Counter, No. 171, good quality, \$21.00  
Hatch, Tea, No. 161, \$21.00  
Union Platform, Plain, \$21.00  
Union Platform, Striped, \$21.00  
Chaffin's Grocers' Trip Scales, 50x  
Chaffin's Eureka, 40x  
Chaffin's Favorite, 40x  
Family, Turnbulla, 30x  
Richie Bros.' Platform, 40x

**Scale Beams.**—See Beams, Scale.

**Scissors, Fluting.** 45x

**Scrapers.**

Adjustable Box Scraper (R. R. & L. Co.) \$4.50  
Box, 1 Handle, \$4.00, 10x  
Box, 2 Handle, \$4.00, 10x  
Defiance Box and Ship, 30x  
Foot, 50x  
Ship, Common, \$3.50 net  
Ship, R. I. Tool Co., 10x

**Screen Window and Door Frames.**—See Frames.

**Screw Drivers.**—See Drivers, Screw.  
**Screws.**

**Beach and Hand.**

Bench, Iron, 55x10x55x10x10x  
Bench, Wood, Bench, \$2.25  
Bench, Wood, Hickory, 20x10x  
Hand, Wood, 25x10x25x10x  
Lag, Blunt Point, List Jan. 1, 1890, 75x10x  
Coach and Lag, Gimlet Point, List Jan. 1, 1890, 75x10x  
Red, 25x10x  
Hand Rail, Sargent's, 60x10x  
Hand Rail, H. & F. Mfg. Co., 70x10x  
Hand Rail, Am. Screw Co., 75x  
Jack Screws, Millers Falls List, 50x50x5  
Jack Screws, F. S. & W., 35x  
Jack Screws, Sargent, 60x10x  
Jack Screws, Stearns', 40x40x10x

**Corb.**

Humason & Becking Mfg. Co., 40x10x50x  
Williamson's, 35x40x35x35x  
Howe Bros. & Hulbert, 35x

**Machine.**

Flat Head, Iron, 55x  
Round Head, Iron, 50x

**Wood.**

List January 1, 1891.  
Flat Head Iron, 72x  
Round Head Iron, 67x  
Flat Head Brass, 72x  
Round Head Brass, 72x  
Flat Head Bronze, 72x  
Round Head Bronze, 65x  
Rovers' Drive Screws, 83x

**Scroll Saws.**—See Saws, Scroll.

**Scythes.**

Grain, 40x5x40x10x  
Grass, 40x10x50x

**Scythe Snaths.**—See Snaths, Scythe.

**Mets.**

**Asi and Tool.**

Aiken's Sets, Avisa and Tools, No. 20, \$10.00, 55x10x  
Pray's Adj. Tool Hds., No. 1, \$12; No. 2, \$12; No. 3, \$12; No. 4, \$12, 25x  
Miller's Falls Adj. Tool Hds., No. 1, \$12; No. 2, \$12, 25x  
Henry's Combination Haft, \$10.50  
Brad Sets, No. 45, \$10.50; No. 43, \$12.50, 70x10x5  
Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50, 30x10x

**Nail.**

Square, \$4.00  
Round, \$3.25  
Buck Bros., 27x  
Cannon's Diamond Point, \$4.12, 20x

**Sheet.**

Regular List, 50x10x

**Saw.**

Stillman's Genuine, \$7.75, 40x5  
Stillman's Imita, \$3.25, 40x5  
Common Lever, \$3.00, 40x5  
Morrill's No. 1, \$15.00; No. 2, \$24.00, 40x10x50x  
Leach's, No. 0, \$9.99; No. 1, \$15, 16x30x  
Nash's, 80x10x90x10x  
Hammer, Hotchkiss, \$5.50, 10x  
Hammer, Bemis & Call Co.'s new Pat., 30x5x

**Bemis & Call Co.'s Lever and Spring Hammer.**

Bemis & Call Co.'s Plate, 10x  
Bemis & Call Co.'s Cross Cut, 12x  
Aiken's Genuine, \$12.00, 50x10x  
Aiken's Imitation, \$7.00, 55x5x  
Hart's Pat. Lever, 20x  
Dianston's Star, 40x10x50x  
Leopold, 40x10x50x  
Atkin's Lever, \$10.00, 10x  
Atkin's Criterion, \$10.00, 10x  
Crossett (Keller), No. 1, \$15.00; No. 2, \$24.00, 40x10x  
Avery's Saw Set and Punch, \$10.00  
Chieftain Co.'s Superior, \$7.00  
Chieftain Co.'s Royal, \$7.00  
Crescent, \$10.00

**Sharpeners, Knife.**

Parkins.

Applewood Hand'es, \$4.00, 40x  
Rosewood or Cocobolo, \$4.00, 4x

**Shavers, Spoke.**  
Iron, 45x  
Wool, 30x  
Bailey's (Stanley R. & L. Co.), 40x10x  
Stearns', 80x10x  
Cincinnati, 25x10x  
Goodell's, \$9.00, 25x

**Shears.**

American (Cast) Iron, 75x10x75x10x5  
Barnard's Lamp Trimmers, \$3.75  
Tinnert's, 20x2x  
Seymour's, List, Dec. 1881, 60x10x10x60x10x10x5  
Heinisch's, List, Dec. 1881, 60x10x10x60x10x10x5  
Heinisch's Tailor's Shears, 35x  
Cast Steel Trimmers:  
First quality, 80x80x10x  
Second quality, 80x10x80x10x10x  
Acme Cast Shears, 10x10x  
Diamond Cast Shears, 10x  
Clipper, 10x10x  
Victor Cast Shears, 75x10x75x10x5  
Howe Bros. & Hulbert, Solid Forged Steel, 40x  
Chicago Drop Forge & F. Co., Solid Steel Forged, 60x  
Davenport Cutlery Co., 60x60x10x  
Clausen Shear Co., Japaned, 70x  
Clausen Shear Co., Nickel, same list, 60x  
Galvanic, 3/4 to 9 in, \$1.00 per inch

**Pruning Shears and Hooks.**

Dianston's Combined Pruning Hook and Saw, \$18.00, 20x10x  
Dianston's Pruning Hook, \$12.00, 20x10x  
E. S. Lee & Co.'s Pruning Tools, 40x  
Pruning Shears, Henry's Pat, \$4.25  
Henry's Pruning Shears, \$4.25  
Wheeler, M. & C. Co.'s Combination, \$12.00, 30x  
Dunlap's Saw and Chisel, \$5.50, 30x  
J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.25  
P. S. & W. Co., 60x

**Tinners', etc.**

Shears and Snips (P. S. & W.), 30x25x  
Snips, J. Mallinson & Co., 33x

**Sheaves.**

**Sliding Door.**

M. W. Co., List July, 1888, 50x10x60x5x  
R. & E., List Dec. 18, 1885, 55x20x  
Corbin's List, 60x10x2x  
Patent Roller, 60x10x2x  
Patent Roller, Hatfield's, 75x  
Russell's Anti-Friction, List Dec. 1885, 60x3x  
Moore's Anti-Friction, 50x

**Sliding Shutter.**

R. & E. List Dec. 18, 1885, 60x10x2x  
Sargent's List, 60x10x  
Reading List, 60x10x10x

**Shells.**

First quality 4, 8, 10 and 12 gauge, 25x10x2x  
First quality, 14, 16 and 20 gauge (\$10 list), 30x10x2x  
75c  
Star, Club, Rival and Climax brands, 35x10x2x  
Self-bolt's Comb. Shot Shells, 15x2x  
Brass Shot Shells, 1st quality, 60x2x  
Brass Shot Shells, Club, Rival, Climax, 60x2x

**Shells Loaded.**

Standard List, July 19, 1890, 40x10x10x

**Ship Tools.**

L. & J. J. White, 30x2x

**Shoes, Horse, Mule, etc.**

**Horse.**

Burden's, Perkins', Phoenix and Bryden's Boss, at factory, \$4.00  
Bryden's Frog Pressure, at factory, \$5.00

**Mule.**

Add \$1 per keg to above prices.

**Oz, Wrought.**

Ton lots, \$1.00  
1000 lb lots, \$1.00  
500 lb lots, \$1.00

**Shot.**

Drop, up to B, 25-b bag, \$1.47  
Drop, up to B, 5-b bag, .35  
Drop, B and larger, 25-b bag, 1.67  
Drop, B and larger, 5-b bag, .40  
Buck and Chilled, 25-b bag, 1.67  
Buck and Chilled, 5-b bag, .51  
Dust Shot, 25-b bag, 2.00  
Dust Shot, 5-b bag, .45

**Shovels and Spades.**

Amer' Shovels, Spades, etc., List Nov. 1, 1888, 20x  
Note.—Jobbers frequently give 5x7x extra on above.

Griffith's Black Iron, 50x10x  
Griffith's C. S., 60x60x10x  
Hubbard & Co., 30x20x7x  
Hussey, Hinna & Co., 15x25x  
Lehigh Mfg. Co., 50x10x  
H. M. Myers Co., 80x  
Payne Pettibone & Son, 35x25x  
Remington's (Lowman's) Pat., 70x10x40x  
Rowland's, Black Iron, 50x10x  
Rowland's Steel, 60x50x60x10x

**Shovels and Tongs.**

Iron Head, 60x10x60x10x5  
Brass Head, 60x10x10x

**Staves.**

Mann's Tin Rim, 50x25x  
Buffalo Metallic, S. & Co., 50x25x  
Shaker (Barber's) Pat. Flour Sifters, \$2.00  
Electric, \$2.00  
A. & W. Sifters, \$2.00  
Hunter's, \$2.00  
Smith's Adjustable Sifters, \$2.00  
Smith's Adjustable Milk Strainer, \$2.00  
Smith's Adjustable T. & C. Strainer, \$2.00

**Staves, Wooden Rim.**

Mesh 18, Nested, \$1.00  
Mesh 20, Nested, \$1.00  
Mesh 24, Nested, \$1.15

**Skains, Thimble.**  
Western list, 75x5x75x10x  
Columbus Wrt. Steel, Special net prices  
Coldbrookdale Iron Co., 60x  
Seneca Falls Pattern, 60x  
Utica P. S. T. Skains, 60x  
Utica Turned and Fitted, 35x

**Slates.**

School, by case, 50x10x50x10x10x

**Snaps, Harness, &c.**

Anchor (T. & S. Mfg. Co.), 65x  
Piton's (Bristol), 50x10x  
Hotchkiss, 10x  
Sargent's Patent Guarded, 70x10x10x  
German, new list, 40x10x  
Covert, 50x10x5x2x  
Covert, New R. E., 50x10x5x2x  
Covert Spring, 60x10x10x

**Snaths, Scythe.**

List, 60x

**Soldering Irons.**—See Irons, Soldering.

**Spittoons, Cuspidors, &c.**

Standard Fiberglass—Cuspidors, 3/4-inch, \$ dos., No. 5, \$8; No. 6, \$9.  
Spittoons, Daisy, 8-inch, No. 1, \$4; 10 and 11 inch, \$4.

**Spoke Shavers.**—See Shavers, Spoke.

**Spoke Trimmers.**—See Trimmers, Spoke.

**Spoons and Forks.**

**Tinned Iron.**

Basting, Cen. Stamp Co.'s list, 70x10x  
Solid Table and Tea, Cen. Stamp Co.'s list, 70x10x  
Buffalo S. S. & Co., 35x2x  
Silver-Plated—(4 mos. or 5x cash 30 days).

Meriden Brit. Co., Rogers, 40x15x  
C. Rogers & Bros., 40x15x  
Rogers & Bro., 40x15x  
Reed & Barton, 40x40x2x  
Wm. Rogers Mfg. Co., 40x15x  
Simpson, Hall, Miller & Co., 40x15x  
Roimes & Edwards Silver Co., 40x15x  
L. Boardman & Son, 60x12x

**Miscellaneous.**

Holmes & Edwards Silver Co., No. 67 Mexican Silver, 50x10x5x  
No. 30 Silver Metal, 50x10x5x  
No. 24 German Silver, 50x10x5x  
No. 50 Nickel Silver, 50x10x5x  
No. 40 Nickel Silver, 50x10x5x  
Wm. Rogers Mfg. Co., 50x10x5x  
Rogers' Silver Metal, 50x10x5x  
25x Rogers' Nickel Silver, 50x10x5x  
German Silver, 50x10x5x  
German Silver, Hall & Eiton, 50x10x5x cash  
Nickel Silver, 50x10x5x cash  
Britannia, 50x10x5x cash  
Boardman's N. K. Silver, List July 1, 1891, 60x5x5x cash  
Boardman's Britannia Spoons, cash lots, 60x5x cash

**Springs.**

**Door.**

Torrey's Rod, regular size, \$ dos \$1.20  
Grass, \$ gr., \$20.00, 20x  
Bee Rod \$ gr., \$20.00, 20x  
Warner's No. 1, \$ dos, \$1.50; No. 2, \$3.50, 40x10x50x  
Gem (Coll), List April 19, 1886, 10x  
Star (Coll), List April 19, 1886, 10x  
Victor Coll, 30x10x50x10x10x  
Champion Coll, 30x10x50x10x10x  
Philadelphia, 5 in, \$5.00; 8 in, \$7.50, 3x  
Cowell's, No. 1, \$ dos, \$15.00; No. 2, \$15.00, 50x  
Rubber, complete, \$ dos, \$4.50, 55x10x  
Hercules, 50x  
Shaw Door Check and Spring, 25x80x55x

**Carriage, Wagon, &c.**

Elliptic, Concord, Platform and Halt  
Scroll, 60x10x10x  
Cliff's Bolster Springs, 25x

**Squares.**

Steel and Iron, 30x10x80x10x10x  
Nickel-Plated, 60x10x60x10x  
Try Square and T Bevels, 60x10x60x10x  
Dianston's Try Square and T Bevels, 50x  
Winterbottom's Try and Miter, 30x10x  
Starrett's Micrometer Calliper Squares, 25x

**Avery's Flush Bevel Squares.**

Avery's Bevel Protractor, 50x

**Squeezers.**

**Fodder.**

Blair's, \$ dos \$2.00  
Blair's "Climax", \$ dos \$1.25

**Lemon.**

Porcelain Lined, No. 1, \$ dos \$4.00, 25x30x  
Wood, No. 2, \$ dos \$3.00, 35x  
Wood, Common, \$ dos \$1.70, 7x  
Dunlap's Improved, \$ dos \$3.75, 30x  
Sammis, No. 1, \$5.00; No. 2, \$3.12, \$18 per dos, 25x10x  
Jennings' Star, \$ dos \$2.50  
The Boss, \$ dos \$2.50  
Dean's, No. 1, \$ dos \$5.50; 2, \$5.50; 3, \$1.90; Quebec, 50x50x5x5x  
Little Giant, 50x50x5x5x  
King, 40x5x  
Hotchkiss Straight Flash, \$ dos \$12.00  
Silver & Co. Glass, \$ gro. \$9.00  
Manny Lemon Juice Extractor, standard, \$ dos \$7.50; \$1.00 improved, \$ dos \$2.00

**Standard Fiber Ware.**—See Ware, Standard Fiber.

**Staples.**

**Blind.**

Barbed, 3 in. and larger, \$7.00  
Barbed, 3 in. and larger, \$7.00  
Fence Staples, Galvanized, Same price as Barbed  
Fence Staples, Plain, \$ See Trd. Rep.

**Steelyards.** 40x10x50x

**Stocks and Dies.**  
Blacksmith's  
Waterford Goods, 40x40x10x  
Butterfield's Goods, 40x40x10x  
Lighting Screw Plates, 25x30x  
Reeco's New Screw Plates, 25x30x  
Reversible Ratchet, 30x  
Gardner, 30x

**Stops, Bench.**

Morrill's, \$ dos \$2, 50x  
Hotchkiss's, No. 1, \$ dos \$10, 40x10x  
Weston's, No. 1, \$10; No. 2, \$2, 40x10x  
McGill's, \$ dos \$3, 10x  
Cincinnati, 25x10x

**Stone.**

Hindostan No. 1, 2; Axa, 3/4; Slips No. 1, 4x  
Sand Stone, \$ dos \$2x  
Washita Stone, Extra, \$ dos \$2x  
Washita Stone, No. 1, \$ dos \$2x  
Washita Stone, No. 2, \$ dos \$2x  
Washita Slips, No. 1, Extra, \$ dos \$2x  
Washita Slips, No. 1, \$ dos \$2x  
Arkansas Stone, No. 1, \$ dos \$1.50  
Arkansas Stone, No. 2, \$ dos \$1.50  
Turkey Oil Stone, 4 to 8 in, \$ dos \$4x  
Turkey Slips, \$ dos \$1.00, 1.50  
Lake Superior, Chase, \$ dos \$13x  
Lake Superior Slips, Chase, \$ dos \$20x  
Seneca Stone, Red Paper Brand, \$ dos \$20x

Seneca Stone, High Rounds, \$ gro \$34.50  
Seneca Stone, Small Whets, \$ gro \$34.50

**Steve Polish.**—See Polish, Steve.

**Stretchers, Carpet.**

Cast Steel, Polished, \$ dos \$9.25  
Cast Iron, Steel Points, \$ dos \$6x  
Socket, \$ dos \$1.75  
Fullard's, 35x35x10x

**Strops, Razor.**

Genuine Emerson, 60x60x5x  
Imitation, \$ dos \$2.00, 20x10x5x  
Torrey's, 30x  
Badger's Belt and Com, \$ dos \$2.00  
Lamont Combination, \$ dos \$4.00  
Jordan's Pat. Padded, List Nov. 1, 1890, \$5.00  
Electric, List net

**Stuffers or Fillers, Sausage.**

Miles' "Challenge", \$ dos \$30, 50x60x5x  
Perry, \$ dos, No. 1, \$15.00; No. 2, \$21.00, 50x10x  
Draw Out No. 4, each \$20.00, 20x  
Enterprise Mfg. Co., 20x10x30x  
Silver's, 40x10x

**Sweepers, Carpet.**

Bissell No. 5, \$ dos \$17.00  
Bissell No. 7 New Drop Fan, \$ dos \$12.00  
Bissell, Grand, \$ dos \$35.00  
Grand Rapids, \$ dos \$34.00  
Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00  
Jewel, \$ dos \$15.00  
Improved Parlor Queen, \$ dos \$17.00  
Nickel, \$ dos \$37.00  
Japanned, \$ dos \$37.00  
Excelsior, \$ dos \$32.00  
Garland, \$ dos \$15.00  
Parlor Queen, \$ dos \$34.00  
Housewife's Delight, \$ dos \$15.00  
Queen, \$ dos \$15.00  
Queen, with band, \$ dos \$18.00  
King, \$ dos \$30.00  
Wood, Improved, \$ dos \$18.00  
Hub, \$ dos \$15.00  
Cog-Wheel, \$ dos \$15.00  
Easy, \$ dos \$22.00  
Monarch, \$ dos \$21.00  
Goshen, \$ dos \$21.00  
Ladies' Friend, \$ dos \$15.00  
Advance, \$ dos \$18.00  
Supreme, \$ dos \$22.00

**Tacks, Brads, &c.**

List October 19, 1889. Old established standard weights. Short weight goods are sold at lower prices.

American, Blued, 75x  
American, Tin'd and Cop'd, 77x  
Steel, Bright and Blued, 72x  
Steel, Tinned and Coppered, 75x  
Swedes Iron, Blued, 72x  
Swedes Iron, Tinned, 75x  
American Iron Tacks—  
Domestic, 72x  
Foreign, 75x  
Swedes Iron Tacks—  
S. S., Blued, 75x  
S. S., Tinned, 77x  
Lanc., Blued, 67x  
Lanc., Tinned, 72x  
Gim and Lace Tacks—  
S. S., Blued, 75x  
S. S., Tinned, 77x  
Lanc., Blued, 67x  
Lanc., Tinned, 72x  
Basket and Trimmers' Tacks—  
Lanc., 65x  
S. S., 70x  
Hungarian Nails, 65x  
Miners' Tacks, S. S., 75x  
Miners' Tacks, Lanc., 70x  
Common and Patent Brads, 65x  
Leathered Tacks, 20x  
Brush Tacks, 50x  
Looking Glass Tacks, 50x  
Picture-Frame Points, 50x  
Finishing Nails, 65x  
Trunk and Clout Nails—  
Black, 65x  
Tinned or Coppered, 65x  
Basket Nails, 65x  
Chair Nails, 62x  
Cigar-Box Nails, 60x  
Tin Capped Nails, 50x  
Miscellaneous—  
Double Pointed, 12 count, 85x10x  
Wire Carpet Nail, 40x10x  
Plymouth Rock Steel Carpet Tacks, 25x  
Wire Brads and Nails, see S. S. Wire.  
Steel-Wire Brads, R. & E. Mfg. Co.'s list, 50x10x

**Tapes, Measuring.**

American, 40x40x5x  
Spring, 40x  
Jesterman's, Regular list, 25x30x

**Thermometers.**

In Case, 30x30x10x

**Thimble Skelue.**—See Skains.

**Ties, Rail.**—See Skains.</



**Tinware**—  
Stamped, Japanned and Plead, list  
Jan. 30 1887.....70¢10¢70¢10¢55¢  
**Tire Sanders, Upsetters, &c**—  
See Sanders and Upsetters, Tire.

**Tools**—  
**Coopers**—  
Bradley's.....30¢  
Baron's.....30¢  
L. & J. White.....30¢  
Alberson Mfg. Co.....30¢  
Beatty's.....30¢  
Sandusky Tool Co.....30¢  
Shaves, Cincinnati Tool Co.....30¢

**Lumber**—  
Ring Peavies, "Blue Line".....\$ dos \$20.00  
Ring Peavies, Common.....\$ dos \$18.00  
Steel Socket Peavies.....\$ dos \$21.00  
Mail Iron Socket Peavies.....\$ dos \$19.00  
Cant Hooks, "Blue Line".....\$ dos \$16.00  
Cant Hooks, Common Finish.....\$ dos \$14.00  
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish.....\$ dos \$16.00  
Cant Hooks, Mail Socket Clasp, Common Finish.....\$ dos \$14.00  
Cant Hooks, Clip Clasp, "Blue Line" Finish.....\$ dos \$14.00  
Cant Hooks, Clip Clasp, Common Finish.....\$ dos \$12.00  
Hand Spikes.....\$ dos \$15.00; 8 ft., \$30.00  
Pike Poles, Pike & Hook, \$ dos, 12 ft., \$11.50; 14 ft., \$12.50; 16 ft., \$14.50; 18 ft., \$17.50; 20 ft., \$21.50.  
Pike Poles, Pike only, \$ dos, 12 ft., \$10.00; 14 ft., \$11.00; 16 ft., \$13.00; 18 ft., \$16.00; 20 ft., \$20.00.  
Pike Poles, not ironed, \$ dos, 12 ft., \$8.00; 14 ft., \$9.00; 16 ft., \$10.00; 18 ft., \$12.00; 20 ft., \$16.00.  
Setting Poles, \$ dos, 12 ft., \$14.00; 14 ft., \$15.00; 16 ft., \$17.00  
Swamp Hooks.....\$ dos \$13.00

**Saws**—  
Atkins' Perfection.....\$ dos \$12.00  
Atkins' Excelsior.....\$ dos \$6.00  
Atkins' Giant.....\$ dos \$4.00

**Tabacco Cutters**—See Cutters, Tobacco.

**Transom Lifters**—See Lifters, Transom.

**Traps**—

**Game**—  
Newhouse.....40¢40¢55¢  
Ondida Pattern.....70¢10¢  
Game, Blake's Patent.....40¢10¢55¢  
**Mouse and Rat**—  
Mouse Wood Choker, \$ dos holes, 11¢12¢  
Mouse, Round Wire.....\$ dos \$1.50, 10¢  
Mouse, Cage, Wire.....\$ dos \$2.50, 10¢  
Mouse, Catch-em-alive.....\$ dos \$2.50, 15¢  
Rat, Decoy.....\$ dos \$2.00, 10¢  
Ideal.....\$ gr \$10.00, 10¢  
Cyclone.....\$ gr \$5.00, 10¢  
Hotchkiss Metallic Mouse, 5-hole traps, \$ dos, 90¢; in full cases, \$ dos.....75¢  
Hotchkiss Imp. Rat Killer.....\$ gro \$15.50  
Hotchkiss New Rat Killer.....\$ gro \$15.50  
Behyler's Rat Killer.....\$ gro \$15.00

**Triers**—  
Butter and cheese.....35¢  
**Trimmers, Spoke**—  
Bonney's.....\$ dos \$10.00, 50¢  
Stearns.....\$ dos \$10.00, 50¢  
Ives, No. 1, \$15.00; No. 2, \$12.00, \$ dos.....\$ dos \$10.00, 50¢  
Douglas'.....\$ dos \$10.00, 50¢  
Cincinnati.....\$ dos \$10.00, 50¢

**Trowels**—  
Lothrop's Brick and Plastering.....30¢10¢55¢  
Reed's Brick and Plastering.....15¢  
Diaston's Brk and Plastering.....25¢  
Peacock's Plastering.....35¢  
Clement & Maynard's.....30¢  
Roser's Brick.....30¢  
Brade's Brick.....25¢  
Worrall's Brick and Plastering.....30¢  
Garden.....70¢

**Trucks, Warehouse, &c**—  
B. & L. Block Co.'s list, '82.....40¢

**Tubes, Boiler**—  
See Pipe.

**Twine**—  
**Flax Twine**—  
No. 1, 2, 3 and 4 Balls.....25¢ 31¢  
No. 12, 14 and 16 Balls.....25¢ 30¢  
No. 18, 20 and 22 Balls.....30¢ 29¢  
No. 24, 26 and 28 Balls.....20¢ 29¢  
No. 30, 32 and 34 Balls.....18¢ 28¢  
No. 36, 38 and 40 Balls.....15¢ 28¢  
No. 42, 44 and 46 Balls.....12¢ 28¢  
Chalk Line, Cotton, 1/2 Balls.....25¢  
Mason Line, Linen, 1/2 Balls.....55¢  
2-Ply Hemp, 1/2 and 3/4 Balls (Spring Twine).....16¢  
2-Ply Hemp, 1/2 Balls.....16¢16¢  
2-Ply Hemp, 1/4 Balls.....16¢16¢  
Cotton Wrapping, 5 Balls to a.....16¢16¢  
2, 3, 4 and 5-Ply Jute, 1/2 Balls.....10¢  
Wool.....8¢9¢  
Paper.....13¢14¢  
Cotton Mops, 6, 9, 12 and 15 Balls.....18¢

**Vices**—  
**Solid Box**.....50¢10¢50¢10¢55¢  
**Parallel**—  
Fisher & Norris Double Screw.....15¢10¢  
Stephens.....25¢30¢  
Parker's.....30¢35¢  
Wilson's.....55¢  
Howard's.....40¢  
Bonney's.....40¢10¢  
Miller's Falls.....40¢40¢10¢  
Trenton.....40¢50¢40¢10¢  
Merrill's.....15¢20¢  
Sargent's.....50¢10¢10¢  
Backus and Union.....40¢  
Double Screw Leg.....15¢10¢  
Prestite.....20¢25¢  
Simpson's Adjustable.....40¢  
Moore's.....40¢  
Massey Quick Action.....20¢ 25¢

**Saw Filers**—  
Bonney's, Nos. 2 & 3, \$15.00.....40¢10¢  
Stearns.....35¢10¢35¢10¢10¢  
Stearns' Silent Saw Vices.....35¢35¢  
Sargent's.....50¢10¢  
Reading.....40¢10¢  
Wentworth.....30¢10¢

**Miscellaneous**—  
Combination Hand Vices.....\$ gr \$42.00  
Cowell Hand Vices.....30¢  
Bauer's Pipe Vices.....10¢  
Cincinnati Pipe Vices, each.....30.00  
Enterprise Pipe Vices.....30.00  
Massey Combination Pipe.....40¢

**Wads**—Price per M.  
J.M.C. & W.R.A.—R.E., 11 up.....65¢  
J.M.C. & W.R.A.—R.E., 9¢10.....85¢  
J.M.C. & W.R.A.—R.E., 8.....95¢  
J.M.C. & W.R.A.—R.E., 7.....\$1.10  
J.M.C. & W.R.A.—P.E., 11 up.....1.15  
J.M.C. & W.R.A.—P.E., 9¢10.....1.50  
J.M.C. & W.R.A.—P.E., 8.....1.70  
J.M.C. & W.R.A.—P.E., 7.....1.80  
J.M.C. & W.R.A.—P.E., 11 up.....\$1.00 1.75  
Slay's P.E., 11 up.....3.00 3.25

**Wagon Boxes**—See Boxes, Wagon.

**Washer Cutters**—See Cutters, Washer.

**Wagon Jacks**—See Jacks, Wagon.

**Ware, Hollow, Enameled, &c**—

**Cast Iron, Hollow**—  
Stove Hollow-Ware.....60¢10¢  
Ground.....60¢10¢10¢  
White Enameled Ware.....  
Mastin Kettles.....70¢10¢70¢10¢55¢  
Boilers and Saucepans.....50¢10¢50¢  
Tinned Boilers and Spans.....50¢10¢50¢  
Rustless Hollow-Ware.....50¢50¢55¢  
Gray Enameled-Ware.....50¢  
Stove.....50¢  
Mastin Kettles.....60¢10¢10¢  
Boilers and Saucepans.....40¢55¢

**Enameled**—  
Agate and Granite Ware, list Jan. 1, 1889.....33¢10¢  
Ironclad Enameled Ware.....dis 33¢10¢

**Kettles**—  
Galvanized Steel Kettles—  
Inch.....6 8 9  
Each.....55¢ 60¢ 75¢

**Standard Fiber**—  
Per Dozen.  
Plain, Dec'd  
Wash-Basins, 10 1/2 in.....\$2.00 \$2.25  
Wash-Basins, 12 in.....2.25 2.75  
Keelers, 11 1/2 in.....4.00 4.50  
Cuspidors.....4.00 4.50  
Spittoons, "Daisy," 8 in.....4.00 4.50  
Peck Measure.....3.50  
See also Pails.

**Indurated Fiber**—25¢  
Spittoons, No. 2, \$ dos.....\$8.40  
Basins, Ringed, \$ dos, No. 3.....\$5.00  
Washbasins, Nested, Nos. 0, 1, 2 and 3 (4 pieces), \$ nest.....\$7.50  
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), \$ nest.....\$2.90  
Butter Bowls, 17 and 18 inch (3 pieces), \$ nest.....\$1.70  
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces) \$ set.....\$1.50  
See also Pails.

**Silver Plated, Hollow**—  
4 mo. or 5 1/2 cash in 30 days.  
Reed & Barton.....  
Meriden Britannia Co.....40¢55¢  
Simpson, Hall, Miller & Co.....  
Rogers & Brother.....  
Hartford Silver Plate Co.....40¢55¢  
William Rogers Mfg. Co.....

**Washers**—  
Size hole.....5-16 1/4 1/2 3/4 to 1 3/4  
Washers.....6 5 3.50 3  
In lots less than 200 B, \$ B, add 1/4, 5-B boxes 1¢ to list.

**Wedges**—  
Iron.....\$ B 3 1/4  
Steel.....\$ B 3 1/4

**Weights, Sash**—  
Solid Eyes.....\$ ton \$18¢\$19

**Well Buckets, Galvanized**—See Buckets, Well, Galvanized.

**Wheels, Well**—  
8 in., \$2.35; 10 in., \$2.70; 12 in., \$2.95

**Wire and Wire Goods**—

**Iron**—  
Br. & Ann'd, Nos. 0 to 18.....77¢1/2  
Cop'd, Nos. 0 to 18.....75¢

Galv., Nos. 0 to 18.....67¢1/2  
Tin'd, Tinned list Nos. 0 to 18.....67¢1/2

**Stones**—  
Br. and Ann'd, Nos. 16 to 18.....77¢1/2  
Bright and Ann'd, Nos. 19 to 20.....80¢  
Br. and Ann'd, Nos. 27 to 30.....82¢1/2  
Tinned.....  
Tinned Broom Wire, 18 to 21, \$ B.....5¢  
Galvanized Fence, Nos. 8 and 9.....70¢  
Brass, list Jan. 13, 1884.....35¢  
Copper, list Jan. 13, 1884.....35¢  
Annealed Wire on Spools.....55¢  
Main's Steel and Tin'd on Spools.....55¢  
Main's Brass and Cop. on Spools.....45¢  
Tare's Spoiled, Tinned and Annealed.....55¢  
Tare's Spoiled Cop. and Brass.....45¢  
Cast Steel Wire.....50¢  
Stub's Steel Wire.....\$6.00 to 2.30  
Steel Music Wire, 12 to 30.....50¢70¢  
Wire Clothes Lines, see Lines.  
Wire Cloth Cord see Cord.

**Bright Wire Goods**—  
Standard list.....90¢10

**Wire Cloth and Netting**—  
Painted Screen Cloth, good quality \$ 100 sq. ft., \$1.40  
Galvanized Wire Netting.....70¢10¢75¢

**Wire, Barb.**—  
F.o.b. cars Pittsburgh and Cleveland, \$2.75 ¢ cwt. for Painted, \$ .25 for Galvanized.  
5¢ ¢ cwt. advance on above f.o.b. cars  
Cin. Inland and Allentown, Pa  
10¢ ¢ cwt. advance for f.o.b. cars Joliet and Chicago.  
15¢ ¢ cwt. advance for f.o.b. cars St. Louis.  
30¢ ¢ cwt. advance for f.o.b. cars Omaha.  
35¢ ¢ cwt. advance for f.o.b. cars Lawrence, Kan.  
\$1.25 ¢ cwt. advance for f.o.b. cars San Francisco.

**Wire Rope**—See Rope, Wire.

**Wrenches**—  
American Adjustable.....40¢  
Baxter's Adjustable "S".....40¢10¢50¢  
Baxter's Diagonal.....40¢10¢50¢  
Coe's Genuine.....50¢25¢  
Coe's "Mechanics".....50¢10¢25¢  
Girard Standard.....50¢10¢  
Lamson & Sessions' Engineers'.....60¢10¢  
Lamson & Sessions' Standard.....70¢10¢  
P. S. & W. Agricultural.....75¢10¢75¢  
Girard Agricultural.....10¢5¢  
Lamson & Sessions' Agric'l.....  
Bemis & Call's  
Pat. Combination.....25¢  
Merrick's Pattern.....35¢  
Briggs' Pattern.....25¢  
Cylinder or Gas Pipe.....40¢25¢  
No. 8 Pipe.....40¢10¢  
Allen's Pocket (Right).....\$6.00, 50¢10¢  
The Favorite Pocket.....\$ dos \$4.00, 40¢  
Webster's Pat. Combination.....35¢  
Boardman's.....20¢10¢  
Always Ready.....25¢55¢  
Alligator.....50¢  
Donohue's Engineer.....30¢10¢  
Acme, Bright.....50¢25¢  
Acme, Nickel.....40¢25¢  
Hercules.....55¢25¢  
Walker's.....55¢25¢  
Diamond Steel.....55¢25¢  
Cincinnati Brace Wrenches.....25¢10¢  
Tate's Vise Wrench.....50¢10¢25¢

**Wringers, Clothes**—  
Am. Wringer Co.'s list, July 15, 91, 2 1/2 cash

**Wrought Goods**—  
Staples, Hooks, &c, list Jan. 13, 1886, 50¢85¢10

## PAINTS, OILS AND COLORS.—Wholesale Prices.

### Animal and Vegetable Oils.

Linsed, City, raw, per gal. 42 ¢ ..  
Linsed, City, boiled.....45 ¢ ..  
Linsed, Western, raw.....40 ¢ ..  
Lard, City, Extra Winter.....58 ¢ ..  
Lard, City, Prime.....56 ¢ 57 ¢  
Lard, City, Extra No. 1.....42 1/2 ¢ 45 ¢  
Lard, City, No. 1.....37 1/2 ¢ 40 ¢  
Lard, Western, prime.....55 ¢ ..  
Cotton-seed, Crude, prime.....55 ¢ 60 ¢  
Cotton-seed, Crude, off grades.....25 ¢ 28 ¢  
Cotton-seed, Summer Yellow, prime.....38 ¢ 39 ¢  
Cottonseed, Summer Yellow, off grades.....32 ¢ 38 ¢  
Sperm, Crude.....67 1/2 ¢  
Sperm, Natural Spring.....73 ¢  
Sperm, Bleached Spring.....73 ¢ 75 ¢  
Sperm, Natural Winter.....73 ¢ 75 ¢  
Sperm, Bleached Winter.....73 ¢ 80 ¢  
Whale, Crude.....45 ¢  
Whale, Natural Winter.....54 ¢ 58 ¢  
Whale, Bleached Winter.....55 ¢ 58 ¢  
Whale, Extra Bleached.....58 ¢ 60 ¢  
Sea Elephant, Bleached Winter.....63 ¢ 64 ¢  
Menhaden, Crude, Sound.....30 ¢  
Menhaden, Crude, Southern.....31 ¢ 32 ¢  
Menhaden, Light Pressed.....31 ¢ 32 ¢  
Menhaden, Bleached Winter.....33 ¢ 34 ¢  
Menhaden, Extra Bleached.....30 ¢ 36 ¢  
Tallow, City, prime.....42 ¢ ..  
Tallow, Western, prime.....42 ¢ ..  
Cocoanut, Ceylon.....64 ¢ 64 1/2 ¢  
Cocoanut, Cochiti.....74 ¢ 74 1/2 ¢  
Cod, Domes, No.....32 ¢ 33 ¢  
Cod, Foreign.....35 ¢ 38 ¢  
Red Elaine.....5 ¢ 5 1/2 ¢  
Red Saponified.....per gal 30 ¢ ..  
Straits.....31 ¢ ..  
Olive, Italian, bbls.....61 ¢ 68 ¢  
Neatfoot, prime.....55 ¢ 65 ¢  
Palm, prime, Lagos.....\$ B 6 ¢ 6 1/2 ¢

### Mineral Oils.

Black, 20 gravity, 25 ¢ 30 ¢ cold test.....per gal 7 1/2 ¢ 8 ¢  
Black, 20 gravity, 15 cold test.....8 1/2 ¢ 9 ¢  
Black, 20 gravity, summer.....8 1/2 ¢ 9 ¢  
Cylinder light, filtered.....15 ¢ 20 ¢

Cylinder, dark, filtered.....13 ¢ 15 ¢  
Cylinder, dark, at'm refined.....10 ¢ 18 ¢  
Paraffine, 23 1/2 to 24 gravity.....12 1/2 ¢ 14 ¢  
Paraffine, 25 gravity.....12 1/2 ¢ 13 ¢  
Paraffine, red, 21 to 22 gravity.....9 1/2 ¢ 10 ¢  
Paraffine, red, 23 1/2 to 24 gravity.....15 ¢ 14 ¢

### Paints and Colors.

Barytes, Foreign, \$ ton \$22.00 \$24.00  
Barytes, Amer. floated.....\$30.00 \$32.00  
Barytes, Amer. No. 1.....\$19.00 \$20.00  
Barytes, Amer. No. 2.....\$15.00 \$16.00  
Barytes, Amer. No. 3.....\$11.00 \$12.00  
Blue, Celestial.....\$ B 6 ¢ 8 ¢  
Blue, Chinese.....50 ¢ 55 ¢  
Blue, Prussian.....25 ¢ 40 ¢  
Blue, Ultramarine.....5 ¢ 25 ¢  
Brown, Spanish.....1/4 ¢ 1 ¢  
Brown, Vandyke, Amer.....5 ¢ 5 1/2 ¢  
Brown, Vandyke, English.....6 ¢ 8 ¢  
Carmine, No. 40, in bulk.....3.10 ¢ ..  
Carmine, No. 40, in boxes or barrels.....3.20 ¢ ..  
Carmine, No. 40, in ounce bottles.....4.20 ¢ ..  
Chalk, in bulk.....\$ ton 2.00 ¢  
Chalk, in bbls., 100 B.....23 ¢ 40 ¢  
China Clay, English.....\$ ton 13.00 ¢ 18.00 ¢  
Cobalt Oxide, prep'd.....3.90 ¢ ..  
Cobalt Oxide, black.....lots 100 B 3.60 ¢ ..  
Cobalt Oxide, black.....less 100 B 2.65 ¢ ..  
Green, Paris, in bulk.....14 ¢ 15 1/2 ¢  
Green, Paris, 170 to 175.....14 1/2 ¢ 15 1/2 ¢  
Green, Paris, small pack.....14 1/2 ¢ 15 1/2 ¢  
Green, Chrome, ordinary.....8 ¢ 11 ¢  
Green, Chrome, pure.....22 ¢ 25 ¢  
Lead, Eng., B.R. white.....5 1/2 ¢ 10 ¢  
Lead, Ann. White, dry or in oil.....\$ 7 1/2 ¢  
Keks, lots less than 5 tons.....\$ 7 ¢  
Keks, lots 5 to 5 tons.....\$ 6 1/2 ¢  
Keks, lots 13 tons and over.....\$ 6 1/4 ¢  
Lead White in oil 25 B tin pails add to keg price.....\$ 1/4 ¢  
Lead, White, in oil, 12 1/2 B tin pails, add to keg price.....\$ 1 ¢

Lead, White, in oil, 1 to 5 B assorted tins, add to keg price.....\$ 2 1/4 ¢  
Lead, red, bbls. and 1/2 bbls.....6 1/2 ¢ 7 1/2 ¢  
Lead, Red, kegs.....6 1/2 ¢ 7 1/2 ¢  
Litharge, kegs.....6 1/2 ¢ 7 1/2 ¢  
Litharge, bbls. and 1/2 bbls.....6 1/2 ¢ 7 1/2 ¢  
Terra, ac.—Lead and Litharge.—On lots of 500 B or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.  
Ocher, Rochelle.....1.35 ¢ 1 1/2 ¢  
Ocher, French Washed.....1 1/2 ¢ 1 3/4 ¢  
Ocher, German Washed.....1 1/2 ¢ 1 3/4 ¢  
Ocher, American.....1 1/2 ¢ 1 3/4 ¢  
Orange Mineral, English.....9 ¢ 9 1/2 ¢  
Orange Mineral, French.....10 ¢ 10 1/2 ¢  
Orange Mineral, German.....9 1/2 ¢ 10 ¢  
Orange Mineral, American.....8 ¢ 8 1/2 ¢  
Paris White, English Cliff.....1.00 ¢ 1.15 ¢  
Paris White, American.....70 ¢ 75 ¢  
Red, Indian, English.....5 1/2 ¢ 7 ¢  
Red, Indian, American.....2 ¢ 6 1/2 ¢  
Red, Turkey.....9 ¢ 14 ¢  
Red, Tuscan.....9 ¢ 11 ¢  
Red, Venetian, American.....1.00 ¢ 1.25 ¢  
Red, Venetian, English.....1.00 ¢ 1.50 ¢  
Sienna, Italian, Burnt and Powd. \$ B.....5 ¢ 6 1/2 ¢  
Sienna, Ital., Burnt Lumps.....14 1/2 ¢ 15 ¢  
Sienna, Ital., Raw, Powd.....5 ¢ 6 1/2 ¢  
Sienna, Ital., Raw Lumps.....2 ¢ 3 1/2 ¢  
Sienna, American, Burnt.....14 1/2 ¢ 15 ¢  
Sienna, American, Burnt and Powdered.....14 1/2 ¢ 15 ¢  
Talc, French.....13 1/2 ¢ 14 ¢  
Talc, American.....1 ¢ 1 1/2 ¢  
Terra Alba, Fr'ch, \$ 100 B.....30 ¢ 1.00 ¢  
Terra Alba, English.....50 ¢ 60 ¢  
Terra Alba, American No. 1.....70 ¢ 75 ¢  
Terra Alba, American No. 2.....40 ¢ 50 ¢  
Umber, Turkey, Bnt. and Powd. \$ B.....3 1/2 ¢ 4 ¢  
Umber, Turkey, Raw and Powdered.....3 1/2 ¢ 4 ¢  
Umber, Turkey, R'w Lumps.....2 1/2 ¢ 3 1/2 ¢  
Umber, Turkey, R'w Amer.....14 1/2 ¢ 15 ¢  
Yellow, Chrome.....10 ¢ 12 ¢  
Vermilion Americ. Lead.....11 1/2 ¢ 17 ¢  
Vermilion, Quicksilver, bulk.....64 ¢ 66 ¢  
Vermilion, Quicksilver, bags.....55 ¢ 67 ¢  
Vermilion, Quicksilver, smaller pkgs.....60 ¢ 71 ¢  
Vermilion English Import.....60 ¢ 62 ¢

Vermilion, Imitation, Eng. \$ B 8 ¢ 26 ¢  
Vermilion, Trieste.....87 1/2 ¢ 90 ¢  
Vermilion, Chinese.....40 ¢ 48 ¢  
Whiting, Common, \$ 100 B.....40 ¢ 45 ¢  
Whiting, Gliders.....50 ¢ 65 ¢  
Zinc, American, dry.....44 1/2 ¢ 5 ¢  
Zinc, French, Red Seal.....\$ B 8 1/2 ¢  
Zinc, French, Green Seal.....\$ B 8 1/2 ¢  
Zinc, French, V. M. X.....\$ B 7 ¢  
Zinc, Antwerp, Red Seal.....\$ B 7 1/2 ¢  
Zinc, Antwerp, Green Seal.....\$ B 8 1/2 ¢  
Zinc, German, L. Z. O.....\$ B 8 1/2 ¢  
Zinc, V. M. in Poppy Oil, Seal, lots of 1 ton and over.....10 1/2 ¢ 11 1/2 ¢  
Zinc, V. M. in Poppy Oil, lots less than 1 ton.....11 ¢ 11 1/2 ¢  
Zinc, V. M. in Poppy Oil, lots of 1 ton and over.....10 ¢ 10 1/2 ¢  
Lots of less than 1 ton.....10 1/2 ¢ 10 1/2 ¢  
Discount, French Zinc, Discounts to buyers of 10-bbl. lots of one or assorted grades, 1 1/2 %; 25 bbls, 2 1/2 %; 60 bbls, 4 %; No discount allowed on less than bbl. lots.

### Colors in Oil.

Blue, Chinese.....\$ B 35 ¢ 40 ¢  
Blue, Prussian.....12 ¢ 13 ¢  
Blue, Ultramarine.....7 ¢ 12 ¢  
Brown, Vandyke.....7 ¢ 12 ¢  
Green, Chrome.....3 ¢ 13 ¢  
Green, Paris.....15 ¢ 18 1/2 ¢  
Sienna, Raw.....7 ¢ 14 ¢  
Sienna, Burnt.....7 ¢ 14 ¢  
Umber, Raw.....7 ¢ 10 ¢  
Umber, Burnt.....7 ¢ 10 ¢

### Putty.

In wooden pails.....\$ .01 1/4 ¢  
In tin cans......02 ¢ .02 1/4 ¢  
In bladders......02 ¢ .02 1/4 ¢

### Spirits Turpentine.

In regular bbls.....38 1/2 ¢ ..  
In machine bbls.....38 1/2 ¢ ..

### Glue.

Low Grade.....\$ B 8 ¢ 10 ¢  
Cabinet.....12 ¢ 14 ¢  
Medium White.....13 ¢ 15 ¢  
Extra White.....17 ¢ 20 ¢  
French.....10 ¢ 12 ¢  
English.....10 ¢ 12 ¢  
Irish.....13 ¢ ..

SEPTEMBER 16, 1891.

5	Burnt Iron.....	6
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